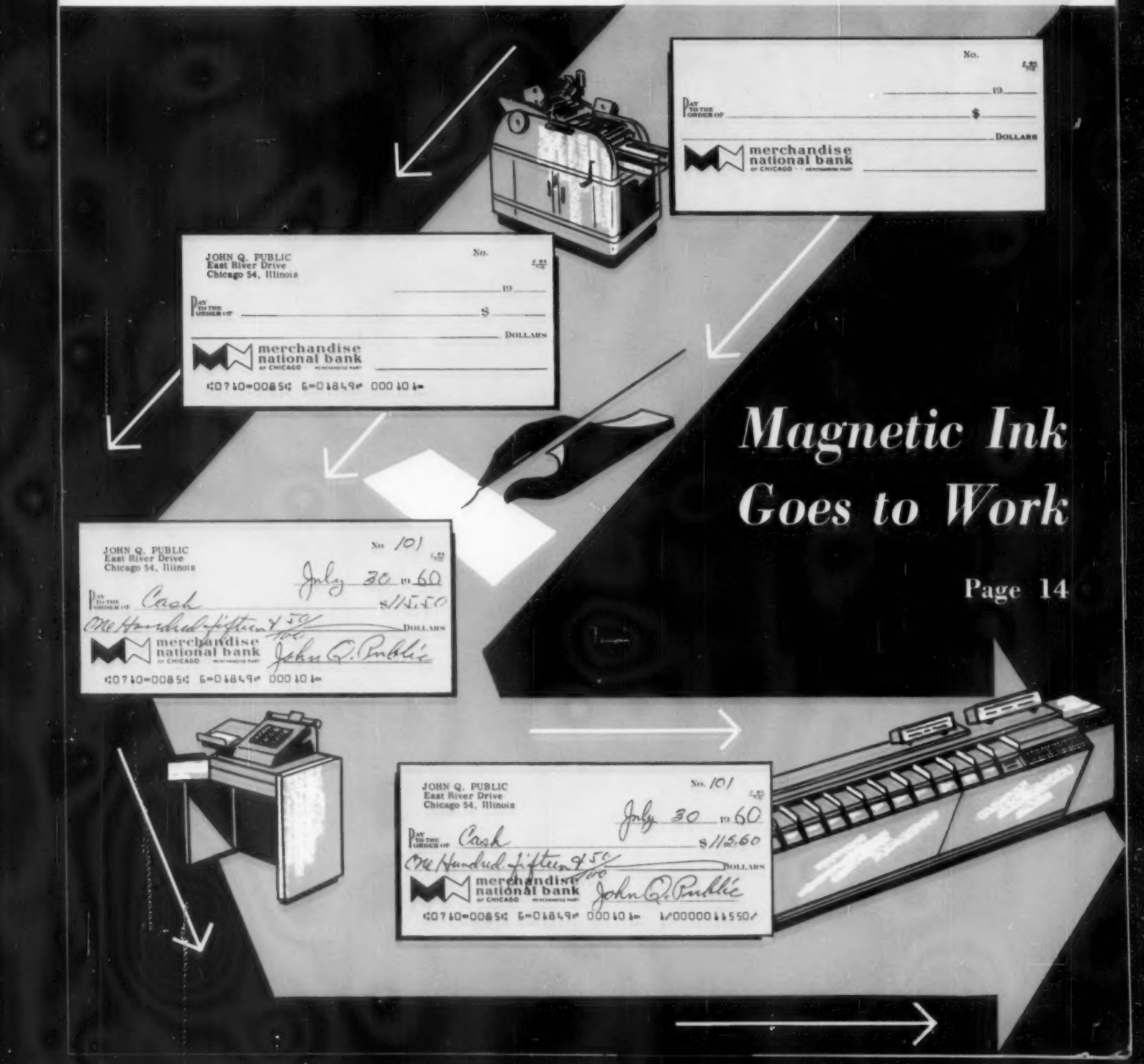
1959
September

# MANAGEMENT *and* BUSINESS AUTOMATION




## *Magnetic Ink Goes to Work*

Page 14

# *Announcing*

## THE STROMBERG® TRANSACTER* SYSTEM

### FOR INDUSTRIAL DATA COLLECTION

Until the development of the STROMBERG TRANSACTER Data Communications System, industrial data gathering and transmission was a relatively primitive operation — completely dependent on manual recording and delivery, and subject to human fallibility every step of the way. The methods and techniques lagged far behind the speed, accuracy and efficiency of electronic machines widely used in data processing.

Now, however, Stromberg Time Corporation has developed, installed, and *proved under actual operating conditions* an electronic system which gathers industrial data at the factory department location, transmits it to the processing center and compiles it on universally machineable paper tapes. It provides the heretofore "missing link" in industrial data processing. *The entire operation*, from factory departments through compilation, now takes only seconds — even when multiple stations are involved.

Simply stated, the TRANSACTER SYSTEM is the first successful data collection system designed specifically for use in the factory. It obviates the necessity for intervening paper work and clerical operations between widely scattered data sources and a central processing office.

Compilation of management reports that has heretofore taken days — even weeks — can now be fully accomplished in *minutes!* Production and inventory control, job costing, receipt and shipment, on-line communication, job order recording — these are just a representative few of the scores of potential assignments for the TRANSACTER SYSTEM in modern industry.

Complete information concerning the Transacter System may be obtained from Stromberg Time Corporation at Thomaston, Connecticut, or from any of its Sales and Service Offices in the U. S. A.

**Trademark of Stromberg Time Corporation.*

INPUT MEDIA for the Transacter System are pre-punched cards or tags containing information obtained as a by-product of a preparatory function, or from master files of repetitive information.

The TRANSACTER *(Transaction Transmitter)* accepts input media and automatically transmits a composite message made up of fixed and variable information to a centrally-located Compiler.

The COMPILER (Receiver-Recorder) accepts messages from remote Transacter stations and synchronously records them in programmed sequence on paper tape at a speed of 60 characters per second.

THE OUTPUT TAPE is suitable for direct input into communications systems, automatic typewriters, tape-to-card converters for tabulating equipment, or electronic data-processing equipment.

THE SYSTEM THAT MAKES IT POSSIBLE FOR PEOPLE TO SPEAK TO MACHINES

**The TRANSACTER SYSTEM will be demonstrated at: THE Business Equipment Exposition, Washington, D. C., September 23-25; Systems & Procedures Association, Toronto, October 12-14; Controllers Institute Conference, Pittsburgh, October 25-28.**

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makers of the world's finest time equipment

**Thomaston, Connecticut**

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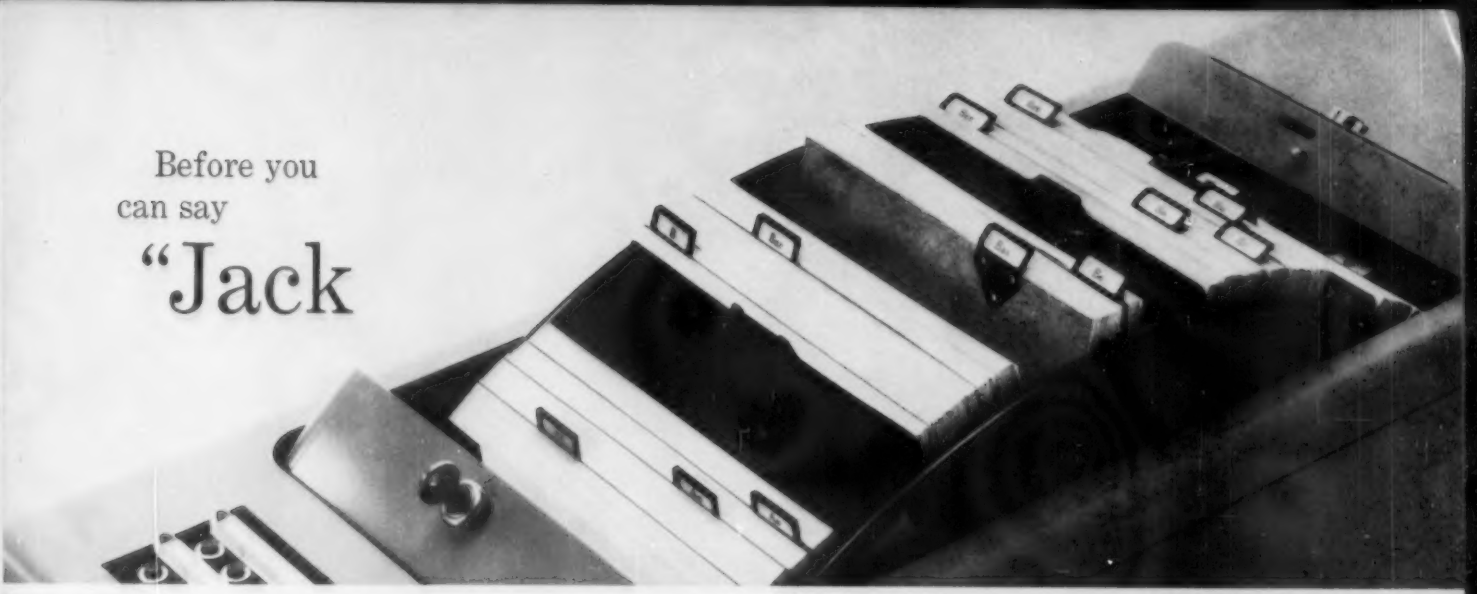
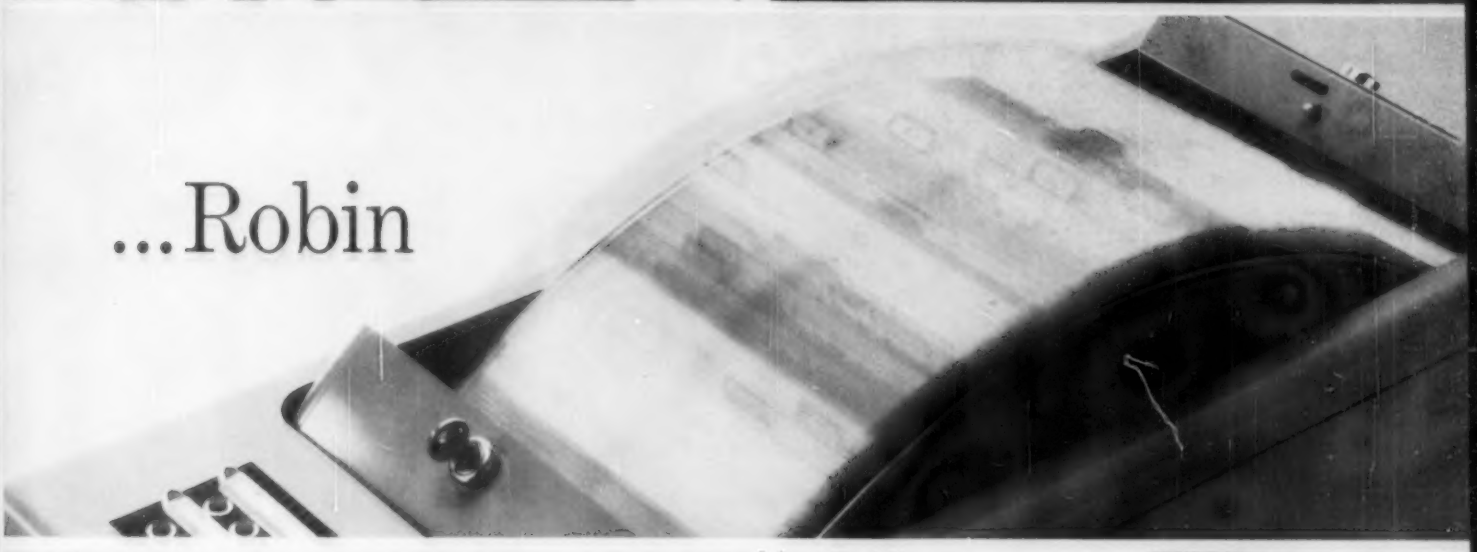
can say
"Jack

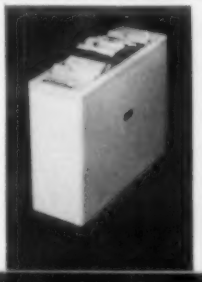


...Robin



...son"

...you've got his card. Or an inventory card, data card, account receivable. *Any* type of card-record. That's provided they're in a REVO-FILE, Mosler's amazing new rotary file. It's entirely different from old style tray files or rotaries in capacity, mobility, and ease of finding and filing. Just *drop* your cards in REVO-FILE... use the coupon, today! **Mosler Revo-File Systems Division.**



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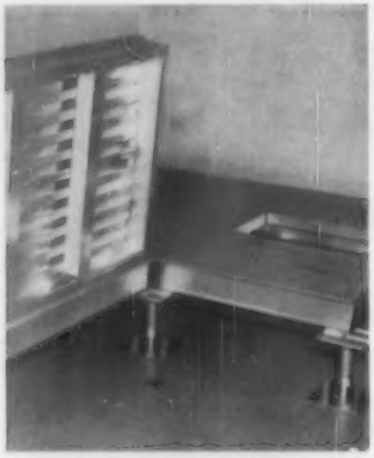
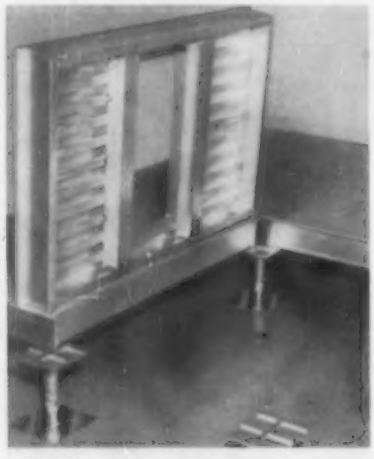


**Exclusive new design reinforced panels eliminate stringers, permit total access!**



WACO "Series 300" raised floors feature reinforced, aluminum panels with stringer-free installation to permit total access to sub-floor; allow cut-outs anywhere on the panel, even after installation, while retaining maximum strength, minimum deflection. Adjustable pedestals assure perfectly level floor for all computer installations.

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Vice president,
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Will you please send me permission to print your editorial "Automation and the Unemployment Myth"?

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*Salt Lake City*

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My compliments to you, the Editor, for your editorial in the July, 1959 issue.

I concur with your sentiments entirely!

S. Berlin
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Fred D. Bauce
Cost Control Manager
The Torrington Mfg. Co.
*Torrington, Conn.*

Dear Sir:

Your publication is read and reread, with great satisfaction by our office staff. Keep them coming!

Edmund J. Krygier
Supervisor, Data Processing
Litton Industries
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Dear Sir:

. . . Your MBA publication is certainly in the "Front Line" on its coverage.

R. A. Tibbits
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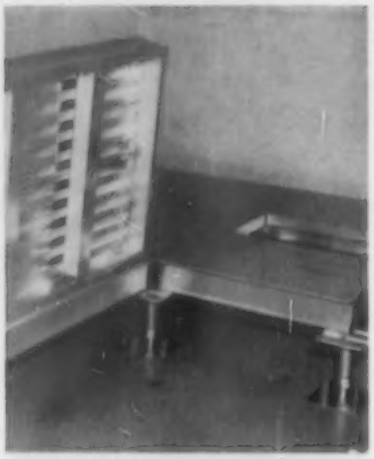
WACO® Raised Floors Perform Perfectly For All Computers



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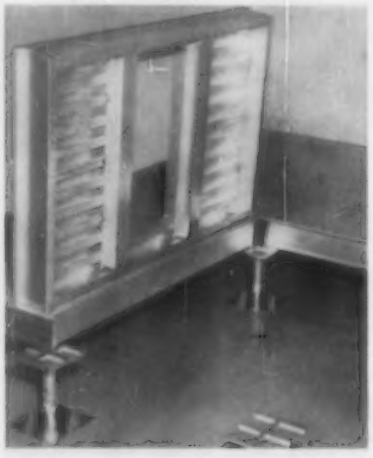

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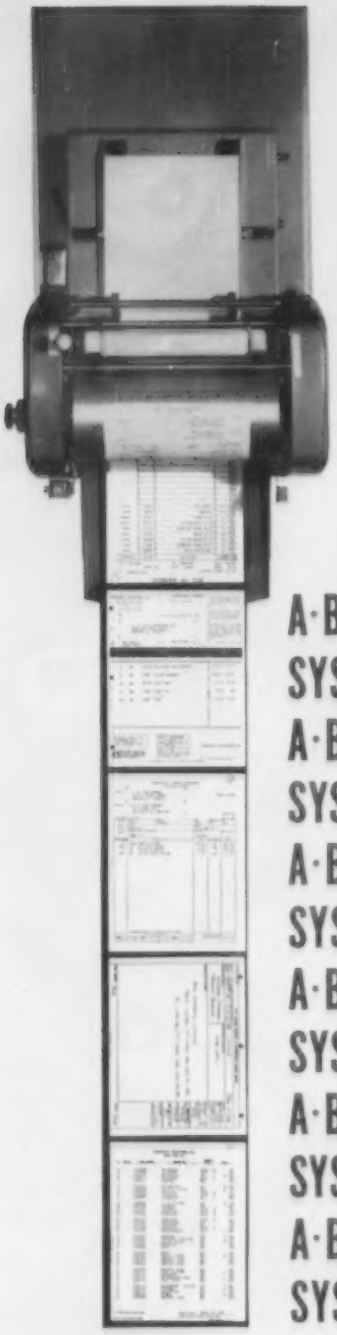

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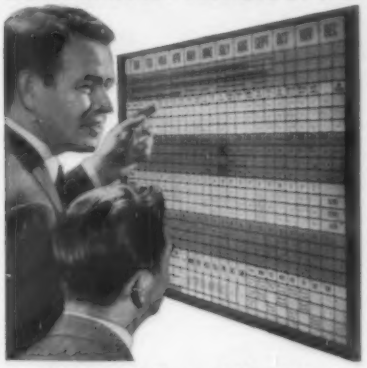

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*. . . from the*

# *Publisher's Desk*

THIS month's cover story is important for a number of reasons.

True, it represents the first detailed press coverage of a complete switch to magnetic ink by a bank. But more important is the story of how a real milestone of business automation was achieved and the boldness with which the executives of Merchandise National planned this move.

The public usually has the notion that any major advance in business management techniques originates with one of the giants of commerce and industry or else in a government agency which has the necessary funds to see such a move through to a successful solution. This story is proof that it doesn't have to be this way.

Merchandise National is not a big bank by most standards. Nor has it had a highly automated paper processing operation up until now. Yet, there was no hesitation on the part of management to move directly into a complete magnetic ink system as soon as the final standards were approved by the A.B.A. last December.

In effect President K. K. DuVall and his able associates decided to "leap-frog" several intermediate steps to automation and install what they felt would someday be their ultimate system anyway.

There's a real lesson here. It's a lesson of the value of an open mind in examining the many new, and seemingly miraculous, advances in technology which are being brought into the business community. It's a lesson, too, that small and medium-size firms need not sit on their hands while their larger competitors make the first steps into uncharted waters.

We salute the Merchandise National Bank. Its management has exhibited unusual business foresight and has followed through with a bold plan of action. This bank is truly a pioneer in business automation and deserves the rewards which most certainly will come its way.

We hope that others will take similar courses with equal foresight and courage.

Charles W. Gilbert

An MBA News Feature

The Rev. Norman Rawson, a keynote speaker for the annual Systems meeting in Toronto.

# *Expect 1,200 to Attend International Systems Meeting*

Eric Moonman, British Management advisor, is also slated as a keynote speaker during the three-day meeting.

THE more than 1,200 members and guests of the Systems and Procedures Association who plan to attend the 1959 International Systems meeting at the Royal York Hotel in Toronto, Canada, will find several new wrinkles in conference organization.

The sessions, scheduled for October 12-14, will include a "Systems Futurama" and a new concept, the "Executive Methods Workshop", aimed at attracting top executives to the meeting.

The Systems Futurama will explore such questions as "How will automation affect the lives of this and future generations?" This, as well as others dealing with the future of electronic data processing, will be clearly pictured by experienced organizations that are recognized as leaders in the field.

Experts in data processing are among those who will participate in the Futurama. They include: Dr. G. M. Hopper, H. V. Fullerton and E. G. Hertzer. Their reports will be based on individual case studies, and include papers on Advanced Systems Application for Management Decision Making, Application of Electronic Data Processing to Regular Ordinary Insurance, using the Univac II, and Alcan's Selection of a Medium Sized Computer—A Feasibility Study.

The Executive Methods Workshop, scheduled exclusively for the benefit of top management executives, will have limited sessions with 15 participants in each. Ideas will be broached and discussed on a pre-determined basis but without any rigid program. The sessions are expected to eliminate what was termed the "half-talk and half-question" format, and in its place substitute creative thinking and discussion.

Headlining the list of speakers at the conference is the Honorable Lester B. Pearson, 1959 Nobel Peace Prize winner. The two keynote speakers are Eric Moonman, British Management advisor to more than 2,000 leading British firms, and the Rev. Norman Rawson, Pastor of St. James United Church. Rev. Rawson was formerly a captain on the General Staff of British Forces in Russia, and he also was at the French battlefront in 1944 as an official Canadian government observer.

Others on the program include Leslie Matthies who will lead the Systems Panorama sessions; F. A. Galbraith, Ontario Hydro-Electric System, and William Nickell of B. F. Goodrich Co., Ltd.; L. H. Souder, Jr., RCA; John P. Dethman, Ford Motor Co., and many others.

Already more than 35 companies producing systems and automated business and data processing equipment have taken space in the exhibit hall. More than 5,000 square feet of exhibits will be on hand.

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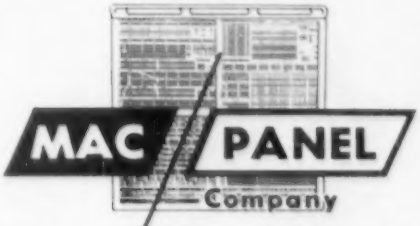


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**West Coast Office and Warehouse:**
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**WRITE FOR ADDITIONAL INFORMATION OR CALL YOUR MAC REPRESENTATIVE TODAY!**

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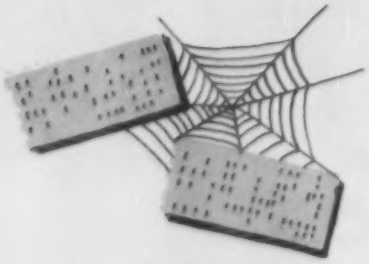

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**If your punched card billing or order writing system isn't producing as fast as you'd like, don't blame the machines! *Outmoded filing systems are unfit companions for today's high speed processing machines.* Give your machines—and your operators—a break! Provide them with a new "modern as tomorrow" *VISI*record system for fast, effective, visible control of punched cards. Among the many advantages you'll gain are—**

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- **No Card Slippage or Binding**
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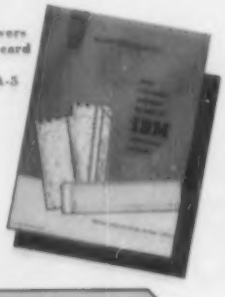
- **More Productive Machine Time**
- **Greater Employee Satisfaction**

**Write now (or attach this ad to your letterhead) for *VISI*record's answers to your punched card filing problems. Address Dept. BA-5**



**VISIrecord, Inc.**
**375 Park Avenue, New York 22, N.Y.**
*The world's fastest visible record keeping system*

Circle Reader Service Card No. 9-57

# *John L. Burns On Automation*

NEVER before has paperwork presented American Business with so serious a problem. Consider these three facts:

(1) In an effort to keep up with the soaring rise of paperwork, our clerical force in the United States has almost doubled, just in the past 15 years, to more than 8 million people—enough to populate a city the size of New York.

(2) The white-collar workers passed the direct laboring group in numbers last year for the first time in our history.

(3) Not long ago, the Hoover Commission noted that the Federal Government produces 25 billion pieces of paper each year—enough, end-to-end, to reach the moon 13 times.

★

As a leader in communications and other aspects of electronics, RCA has long had a deep interest in electronic data processing techniques.

★

In the years 1946 to 1951, our people built for the Navy "Project Typhoon"—one of the largest analogue computers in the world. This single installation saved the Government tens of millions of dollars by simulating performance characteristics of guided missiles, ships and submarines.

★

The consensus is that, for both Government and business, the best solution to the paperwork problem lies in electronic data processing.

★

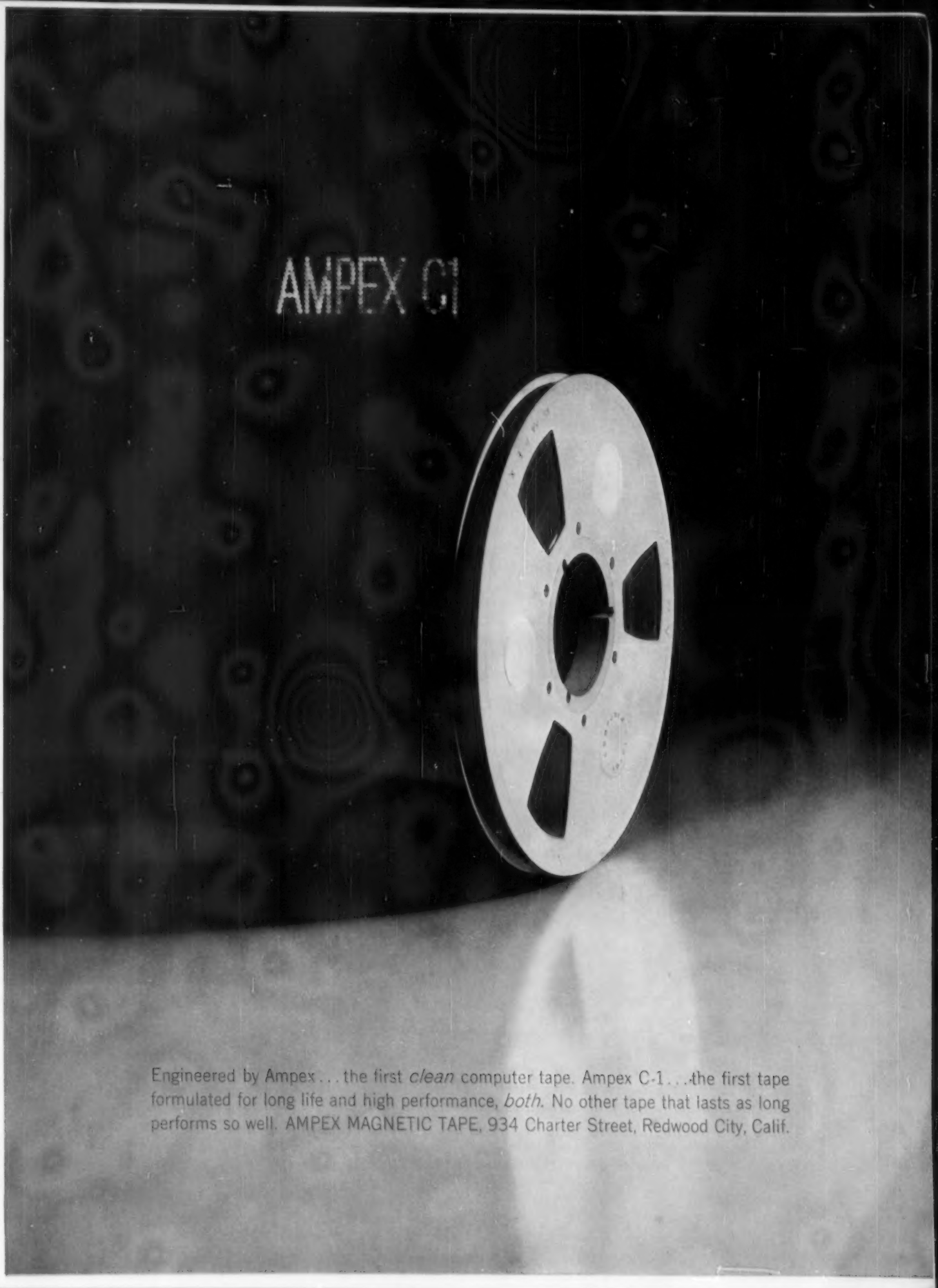
The computer service center is a kind of electronic gas station where small businessmen can have their paperwork serviced while they wait.

★

The day may not be far off when it will be as easy for a small businessman to visit a data processing center as it is for a housewife to visit a laundromat.

★

*John L. Burns is president of Radio Corporation of America. These remarks were contained in an address marking the opening of RCA's Electronic Computer Center at Camden, N.J.*




Engineered by Ampex . . . the first *clean* computer tape. Ampex C-1 . . . the first tape formulated for long life and high performance, *both*. No other tape that lasts as long performs so well. AMPEX MAGNETIC TAPE, 934 Charter Street, Redwood City, Calif.

An MBA News Feature

# *Washington Is Scene Of First Business Equipment Exposition*

Roy A. Johnson, director of the Advanced Research Projects Agency, Department of Defense, will keynote the opening of the OEME show in Washington.

A STRIKING array of data processing equipment—ranging from a solid state electronic computer to a "semi-electric" typewriter—goes on view September 23 to 25 in the Washington, D.C. National Guard Armory.

The exhibits, representing the latest products of 36 corporations whose sales volume claims about 90 percent of the $4 billion-a-year business equipment industry, are sponsored by the Office Equipment Manufacturers Exhibits, an "action" affiliate of the Office Equipment Manufacturers Institute.

The two-day show in Washington, expected to attract 25,000 executives and government management men, is the inaugural exhibition in a series that will be presented each year in several major cities throughout the country.

Already two more shows have been scheduled. One is to be in Chicago on March 15, 16, 17 and 18 in 1960, another will be held in Dallas on October 19-21, 1960.

The first exposition is being held in Washington to tie-in with the industry's salute to all branches of the Federal Government. The entire series has been designed to afford all of the industry customers the opportunity to see a full-scale business equipment panorama with the equipment in action.

Backing up this idea, the 36 exhibitors have made careful plans to put their equipment to good use during the show. Visitors traveling through the huge Armory can see key automation installations set up to demonstrate the speed of handling edge-punched cards and tapes. They can view a completely new system for the automatic imprint of data into machine accounting systems, machines designed to multiply the output and extend the utility of data processing equipment, and a typewriter that has all action keys motorized with a manual carriage.

Those interested can watch a new magnetic ink character sorter sort checks and other media at more than 1,500 items a minute. They can see electronic transmitters and receivers sending graphic information by wire and radio, and watch a new high-speed electronic process capable of printing and displaying material at the rate of 20,000 characters per second.

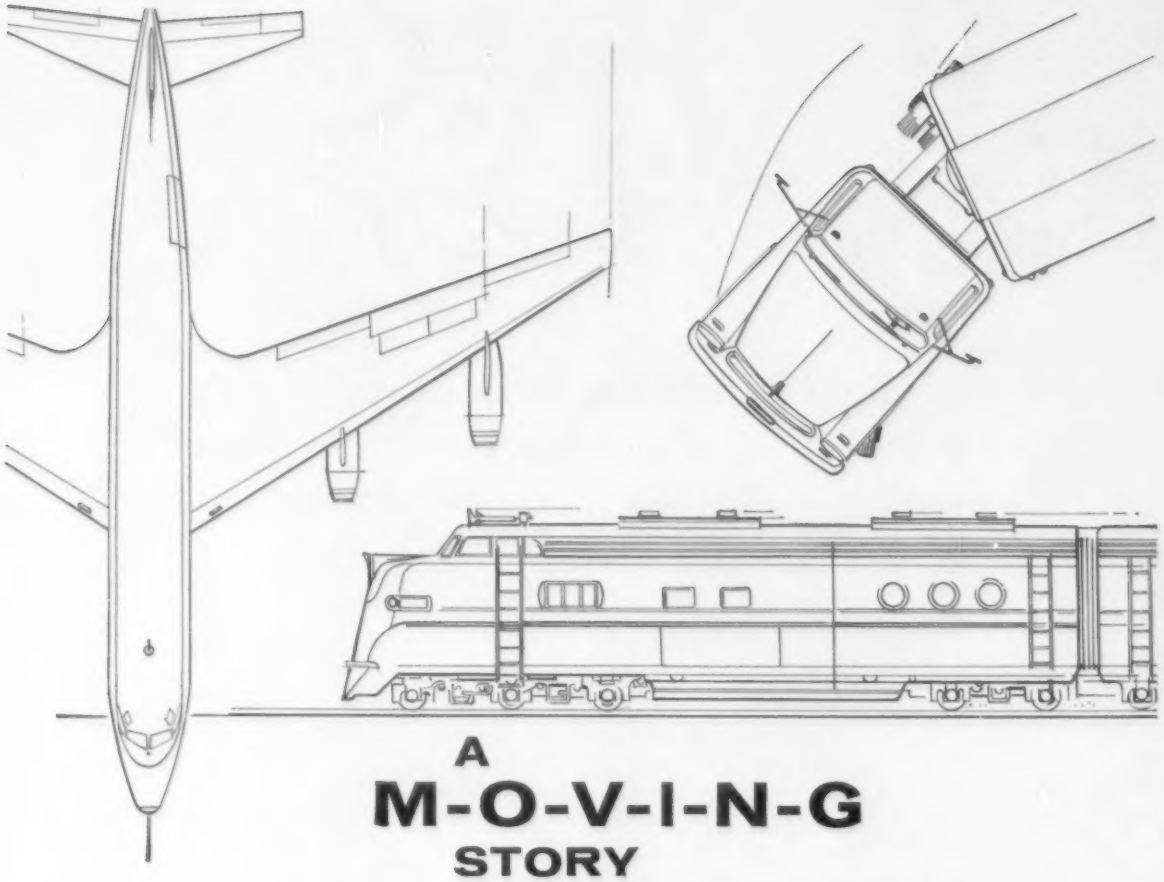
These are but a few of the items which will be displayed by the manufacturers. All of the equipment will be in full action, including the electronic business machines, for the viewers to inspect and study.

The 36 corporate exhibitors include: Acme Visible Records, Inc.; Addressograph-Multigraph Corp.; R. C. Allen Business Machines, Inc.; American Automatic Typewriter Co.; American Photocopy Equipment Co.; Art Metal Construction Co.; Charles Bruning Co., Inc.; Burroughs Corp.; Clary Corp.; Comptometer Corp.

Ditto, Inc.; A. B. Dick Co.; Dictaphone Corp.; Diebold, Inc.; Edison Voicewriter division of Thomas A. Edison Industries; Eastman Kodak; Friden, Inc.; General Binding Corp.; Haloid Xerox Inc.; International Business Machines Corp.; A. Kimball Co.

Lefebure Corp.; National Cash Register Co.; Moore Business Forms, Inc.; Pitney-Bowes, Inc.; Recordak Corp.; Monroe Calculating Co.; Remington Rand division of Sperry Rand Corp.; Royal McBee Corp.; Shaw-Walker Co.; Smith-Corona Marchant, Inc.; Standard Register Co.; Stromberg Time Corp.; Vari-Typer Corp.; Victor Adding Machine Co. and VISIrecord, Inc.

As an inaugural highlight, Roy W. Johnson, director of the Advanced Research Projects Agency, Department of Defense, will be guest speaker at special dedicatory ceremonies on September 22. Mr. Johnson was formerly executive vice president of the General Electric Co. A special message from President Eisenhower is also slated for the dedication ceremonies.



# A M-O-V-I-N-G STORY ABOUT PAPERWORK SAVINGS!

With modern Bruning Copyflex copying machines, you can put a happy ending to one of the saddest wastes of time and money, move products to customers faster!

With Copyflex, you eliminate clerical copying, speed such major business operations as order-invoice, purchasing-receiving, accounting, and production control.

Customer orders, for instance, are written or typed once; invoices, shipping papers, etc. are reproduced by Copyflex from the original order. No rewriting or retyping of repetitive information, no proofreading, no copying errors. Waybills and other transportation forms are speeded as in no other process.

Versatile Copyflex can be adapted to single sheet, snap-out, or continuous forms. It makes sharp, black-on-white copies (or color-tinted) at 1¼¢ each for letter size. Machines are clean, quiet, and odorless.

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An MBA Interview

# *Magnetic Ink Goes to Work*

**The story of a bold leap from non-automation to a new concept in data processing systems, using magnetic ink character recognition.**

By Arnold E. Keller

SINCE first unveiling the dramatic story of magnetic ink (See MANAGEMENT AND BUSINESS AUTOMATION, March '59 issue) the editors of MBA have been convinced that the many developments in the field of character sensing would soon bring about totally new concepts in data processing—concepts that would make possible the automation of many clerical and paperwork functions previously believed to be economically beyond the reaches of electronic data processing. In MICR—magnetic ink character recognition—we have the first of these concepts in system form.

One of the first to install such a system is the Merchandise National Bank of Chicago. Actually, they are second only to the Bank of America in this type of installation. Merchandise National, whose resources hover between $80 and $85 million, intends that their system—a G.E. 210 MICR computer—will be in operation by the summer of 1960, with demand deposit accounting as the initial application.

For a business of medium size to pioneer in the revolutionary method of processing magnetic ink character is in itself unusual. But to move into this advanced area from a totally unautomated system is virtually without precedent. This was not an impulsive step, however, but the result of years of patient study, gathering of solid facts, and sound management decision.

In an interview with H. F. Tubergen, Jr., vice president and comptroller, and Glen R. Reiman, assistant comptroller, the bank officials chiefly responsible for the system's installation, MANAGEMENT AND BUSINESS AUTOMATION has gathered for the reader a detailed explanation of how the study was conducted, the decisions reached, and the program implemented.

Graphic flow charts of the operation are shown on pages 16 and 17, and a list of the system components appears on page 37. The questions here were posed by MBA Editor Arnold E. Keller. The answers are the words of Mr. Tubergen and Mr. Reiman, as indicated.

*What is there in the background of the Merchandise Bank and its operations that prompted this advanced move in the field of data processing?*

Mr. Tubergen: We are a medium-sized bank, located in the world's largest commercial building—The Merchandise Mart. Merchandise National, we believe is a bank that is uniquely equipped to service small and medium business, although we count among our customers some of the biggest firms in the world.

The bank is predominately commercial with a high degree of lending activity in three areas: business, installment and mortgaging. Then too, with approximately 30,000 people employed in stores, offices and showrooms in the Merchandise Mart, the heavy activity experienced is unlike the typical activity found in a bank of this deposit level. We believe we are on a "fast track" and, as a result, we run a shop that is costly to maintain at efficient levels of performance. Because of our location in the heart of a commercial and manufacturing area, we are not a community bank as the term is generally considered.

The MBA camera catches the two Merchandise Bank officials chiefly responsible for "magnetic" decision. Left to right, Glen R. Reiman, assistant comptroller, and H. F. Tubergen, Jr., vice president and comptroller. Results of a two year study convinced them that the MICR system, though revolutionary today, will be the accepted method of data processing for tomorrow's business man.

The bank has pride in its pioneering activities in several fields—installment lending, low cost checking accounts with the automatic loan feature, accounts receivable lending, and many other lesser features.

*You mention "efficient levels of performance" — Is this performance achieved through the traditional methods of operation and control?*

Mr. Tubergen: In 1953, the bank established a Planning and Research department under the administration of the comptroller. The philosophy under which this activity was planned, and which incidentally still holds true, was that every operation of the bank as a whole would be under constant scrutiny; that any method, be it traditional or not, that could be applied and was consistent with sound banking practices, would be installed. Some of the methods, or shall we say "management tools", have been available for use for a long time; yet they may not be traditional banking methods.

For example, we believe in a clean organization plan—one with clear cut lines of authority and without overlap. The plan clearly indicates each function's place in the organization, but more important—it shows the exact place and responsibility of each person on the management team.

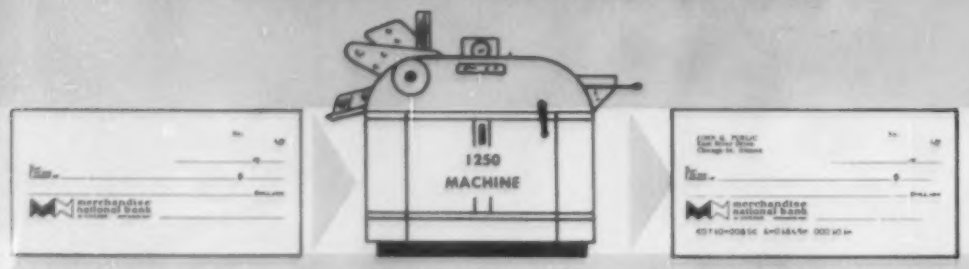
A personnel quota based on activity records and on the time requisites of each activity has been established for each department. The quotas presuppose, and it is a fact, that there are operating standards for each highly repetitive job. A good example is that of the machine bookkeeper's job, or a proof machine operator's job or that of a check sorter.

Following this plan, it was only natural that a job evaluation program was installed. Each non-official job in the bank is completely described, and on the basis of that description, evaluated in terms of relation to the TO (Total Operation) as a whole and in relation to market prices for these jobs.

A series of ranges has been established which apply to every job, and these ranges are realistic enough that they are made to stick.

Another "must" in the way of management tools is a rather thorough-going method of em-

## MAGNETIC CHECK IMPRINTING

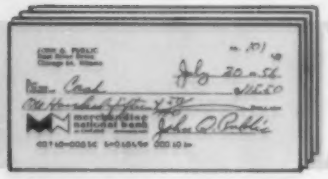



CHECKS and DEPOSIT TICKETS

Addressograph-Multigraph #1250 personalizes documents and imprints characters in magnetic ink.

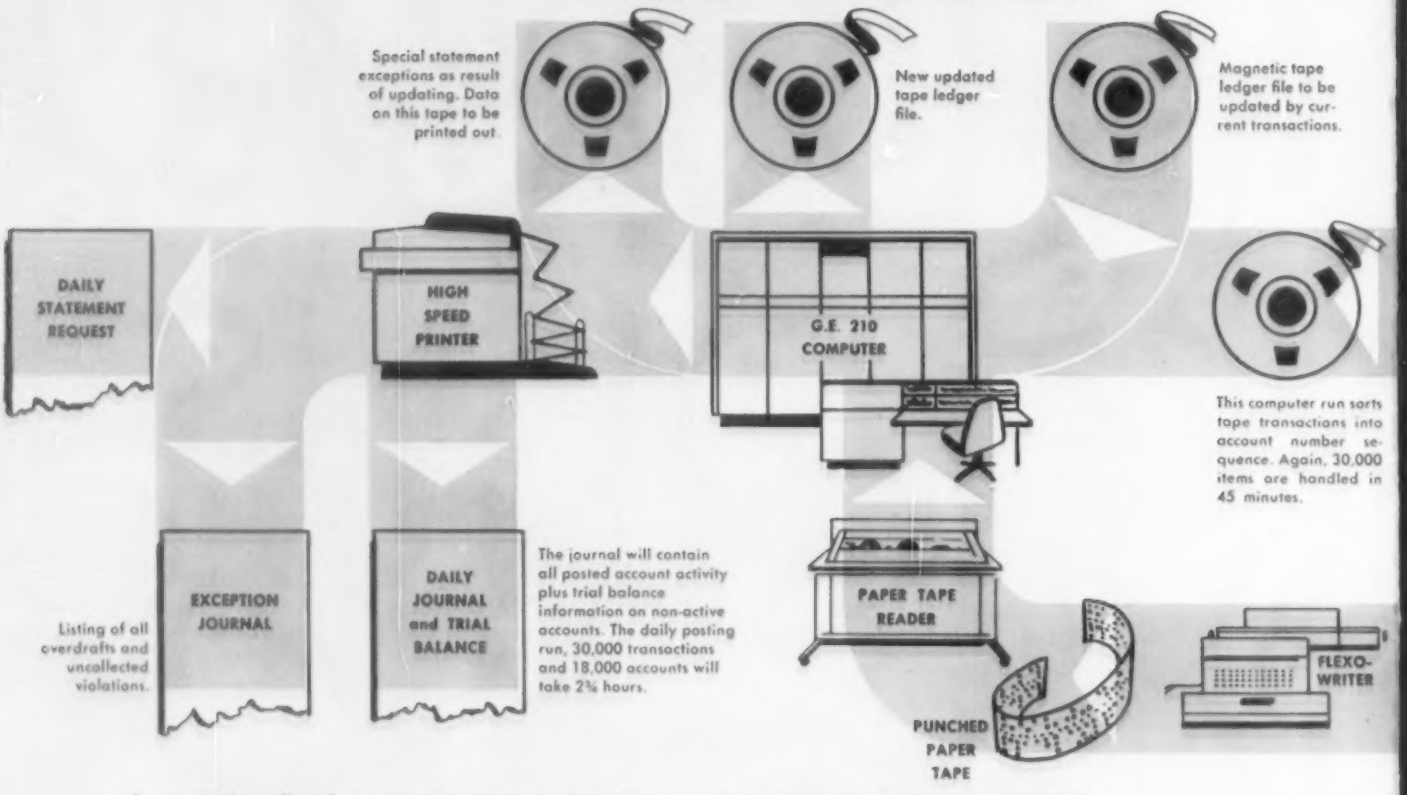
Personalized checks and deposit tickets have bank identification field, check number, and customer account field encoded in magnetic ink; then issued to customer.

## PROVING AND



Batches of checks and deposit tickets, received from other banks and from internal operations, feed into system.

## DAILY POSTING RUN


Special statement exceptions as result of updating. Data on this tape to be printed out.
New updated tape ledger file.
Magnetic tape ledger file to be updated by current transactions.
DAILY STATEMENT REQUEST
HIGH SPEED PRINTER
G.E. 210 COMPUTER
This computer run sorts tape transactions into account number sequence. Again, 30,000 items are handled in 45 minutes.
Listing of all overdrafts and uncollected violations.
EXCEPTION JOURNAL
DAILY JOURNAL and TRIAL BALANCE
The journal will contain all posted account activity plus trial balance information on non-active accounts. The daily posting run, 30,000 transactions and 18,000 accounts will take 2¾ hours.
PAPER TAPE READER
FLEXO-WRITER
PUNCHED PAPER TAPE

ployе work and salary review. This is diligently followed.

*Most of the things you've mentioned are in the way of personnel control. Why is so much effort expended in this direction?*

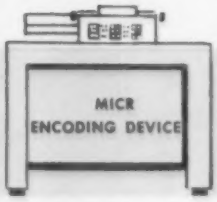
Mr. Tubergen: Over half of our expenses are compensation expenses . . . salaries, attendance awards, hospitalization, group life insurance, bonuses, pension plan, and some lesser benefits. Because of the magnitude of this total, it behooves a good bank manager to spend a proportionate effort in controlling the costs involved here. Even with a degree of control effort, compensation costs will rise perhaps 7 per cent a year; conversely, without control, there is seemingly no limit on cost increase.

*Aren't these controls a necessity in most businesses?*

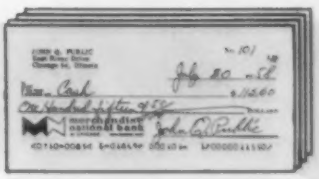
Mr. Tubergen: In some form or another, perhaps in varying degrees to fit the circumstances, yes, every business should exercise personnel control. Not only do these tools serve to hold costs, but the build-up of controls help the manager to better know his own operation.

Operational research per se, is certainly not new, but just as certainly it is too often neglected. It seems paradoxical that management can investigate new methods when they are not truly ac-

## ENCODING DOCUMENTS




Documents are proved and encoded with magnetic characters in dollar amount and transaction type field. Batch totals are also created.



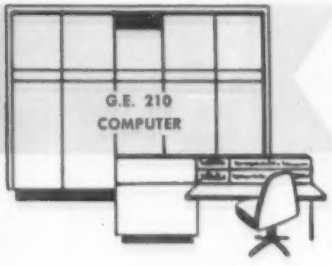
Documents are fully prepared for direct entry into computer system.

## DOCUMENT SORTING

Electronic Document Handler sorts and segregates documents during the first pass under computer control. Validity of documents, proof and audit controls are established. Document entry for 30,000 items requires 45 minutes. Non-valid documents are rejected for investigation.

Sorted valid documents are inspected, cancelled and filed.

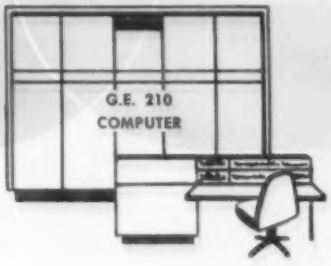
## COMPUTER SORTER RUN



A magnetic tape is prepared containing information from valid documents only. Transactions on the tape are in the same sequence as the batches fed into the document sorter.

Customer account additions and deletions, changes and adjustments, are punched into paper tape and entered into the system in advance of posting current items to the ledger file.

## DOCUMENT ENTRY RUN



This listing contains all pertinent data from the documents fed into the sorter-system, and in the same sequence as the original batches. Items rejected by the computer are identified and the reason for the rejection is noted.

quainted with the methods presently employed . . . it's like buying a pair of shoes for someone when you don't know the size of his foot.

Before any banker, or for that matter any businessman, embarks on a program of outside research, we are convinced that he must know his own operation.

*What prompted your study of computers?*

Mr. Tubergen: The bank's study of computers followed by many months the expression of an intention to study and learn any, and every, new method of accounting that could, by any stretch of the imagination, be applied to a banking operation.

The study encompassed mechanical, semi-electronic, and finally, fully-electronic methods. Initially, then, our study was launched in an effort to decrease costs or at least freeze costs and improve efficiency. Recall the annual 7 percent increase in costs mentioned earlier.

*How did this investigation start?*

Mr. Tubergen: A memorandum to President K. K. DuVall in January, 1957, explained the bank's equipment position at that time . . . the prospect was one of heavy replacement expenditure for equipment which would do little or no more than equipment we've all been familiar with for years. There certainly would have been no cost freezing

"Naturally, any change in an existing system will start rumors flying about possible loss of jobs. We thought it best to present all the facts directly to the employes. In our judgement, the new system should result in a reduction of some 36 people from the payroll."

"The biggest problem with the printing operation can be charged to lack of proper education. There simply isn't enough accurate knowledge dispersed to the printing industry in regard to magnetics."

nor savings, and very frankly the end result would be little changed from the kind of service the customer was getting. I don't mean the service was bad—it just wasn't getting any better.

The memo described briefly what we saw for the future in operations, and in view of this fascinating future, approval was requested to detach one person from all bank functions. He would be turned loose, on a liberal expense account, to visit all equipment manufacturers, attend all appropriate schools, visit the more progressive banks, question research experts, and return with recommendations to management at the end of a stated period. He was to be ready with facts about the type of replacement equipment needed to better do our job.

At this point, swinging to any kind of computer system was the farthest thought from our minds. This effort was primarily an educational effort . . . it was not designed to justify any system or machine. In fact, at that time, we were more or less convinced (based on hearsay) that our bank was "much too small" to justify even thinking about a computer. Even today we hear all too often that what we are contemplating just can't be done. We know that it can be done!

*Where did you find a person qualified to make this study?*

Mr. Tubergen: Although serious consideration was given to several members of the staff, deliberation narrowed down to the person who was then manager of the planning and research department. We had in mind definite qualifications that had to be met. The candidate had to have an analytical mind, be a quick thinker, keep level-headed under pressure, have a knowledge of bank operations, be easily educable, and be young. Equally important, the candidate had to have an understanding wife who would not object to his constant traveling. (The man chosen for this job was Glen Reiman.)

*What were the initial steps taken in the study?*

Mr. Reiman: First came a thorough re-study of demand deposit and installment loan accounting. We reviewed again the methods used in these operations and confirmed the operational standards and personnel quotas previously established. But this time we looked into another item as well —perhaps the most important information needed in considering any system change—the "replaceable" costs of each operation.

For example, a bookkeeper posting ledger transactions performs a number of separate steps to accomplish the posting. These include seeking the ledger, placing the ledger into the machine, picking up the balance and keying it into the machine, posting the transaction and placing the ledger back into the file. In our survey, each of these various steps was timed and assigned a cost value.

Thus, the replaceable costs would be the value of any of the steps eliminated by a new system. With reference to this same example, if one of the "tronic" machines were adopted for the posting

operation, the balance pickup would become automatic and eliminate this particular step from the operator's procedure. The cost of this step would be the replaceable cost to be used in evaluating the new equipment.

Under a computer concept, the ledger posting would be eliminated, so the total cost of the operation would become the replaceable cost.

*Were you investigating various systems being marketed at the time?*

Mr. Reiman: Yes, actually there were many overlaps in the study period. The study began in January, 1957, and continued for about two years. The final equipment decision was made in December, 1958. We frankly expected the study to take only six months, but we quickly revised our estimate when we discovered the vast area which had to be covered.

One thing which prolonged the study was the failure of most of the equipment manufacturers to grasp the problems of bank paperwork handling. The result was that a considerable amount of time was consumed in detailing the bank's specific problems to these companies.

*Can you tell us the general pattern of the two-year study?*

Mr. Reiman: As we mentioned, there was considerable overlap. But in general, an approach was made to at least five of the leading manufacturers of computer systems as well as to the two "tronic" companies.

However, the use of the "tronics" was ruled out early in the study. We considered them as merely an improvement over our present bookkeeping equipment, and at best, only an intermediate step to a completely automated system. Our replaceable costs study indicated that "tronics" would increase the cost over our existing system.

Accordingly, we devoted full time to the various computer-type systems. Our research procedure called for three steps: study, apply and evaluate. We first made a thorough study of each component of a given system. This study included attendance at programming schools, visits to installations and tours of the manufacturing plants and research laboratories. Once a solid background of the equipment was ascertained, we applied the system to our specific application. This step was carried out in conjunction with the equipment representatives.

Finally we evaluated the results, taking into consideration the conversion costs, staffing and housing requirements, and the replaceable costs. The three steps—study, apply and evaluate—were carried through for each of five equipment manufacturers.

**Kenneth K. DuVall**

President, Merchandise National

*"Why has the management of a mid-sized bank ventured into the revolutionary methods of a computer using magnetic ink character recognition for deposit and other accounting functions?*

*"The wisdom of the decision was indicated by several years of research by staff members in whom full confidence is placed. The computer not only points to the most efficient handling of our own accounting problems, but it also holds the promise of a new service for our customers and prospects in facing their problems. The fact that our bank is mid-sized is no handicap; to the contrary, knowledge of our competitive position is a constant spur rather than a hindrance in matters involving progress. We cannot afford to stand still and find ourselves, even temporarily, at a disadvantage in service or costs."*

Through this program we gained a thorough knowledge of all competitive equipment and each manufacturer had a complete picture of the bank's application. All five proposals were then carefully compared against each other.

With the exception of General Electric, all of the proposed systems utilized punched cards as the input medium. With the proposals came the cautioning "crawl before you walk" philosophy, suggesting the use of cards as a "safe" prelude to more advanced systems.

We were convinced, however, after viewing the progress made in magnetic character recognition

*Continued on Page 37*

Evaluating Data Processing Systems

# *General Purpose / Custom-built*

**If a general purpose computer is selected, to what extent will the company be paying now for future potential or for capability which is not now required?**

**If special purpose equipment is the choice, to what extent will standard modular units be used to keep the initial costs at minimum and replacement parts readily obtainable?**

By Robert Minor

WHEN management decides that present and future requirements of data handling warrent the consideration of electronic equipment, it usually means the selection of one of several well-known general purpose computers to handle the job.

However, the company embarking on a computer program should be aware of another approach to the problem of handling business data—the availability of custom-built equipment tailored to specific needs of individual data processing requirements.

General purpose computers, originally designed for scientific applications, are capable of high-powered arithmetic and processing. Adapted to business, their range and versatility are extremely wide, and in most cases they stand ready to do much more for a company than required. They are also expensive and complex in operation.

Special purpose equipment, on the other hand, is tailored to the specific requirements of a particular business. It provides the information and reports needed, but not in the sweeping style of the general purpose computer. This equipment is also modular in form, providing for system expansion as the need arises.

If management is the best judge of what procedures and information are needed, then it has the responsibility of setting the system's requirements. It is logical to assume that the equipment should conform to these requirements, but this has not always been the case. Experience has shown that in some instances electronic equipment has actually dominated management in the determination of systems and procedures.

This is why so much emphasis is now placed on the need for a thorough study of the data handling problem before any purchasing action is initiated. It is an American characteristic that no two companies have the same system and procedures

for information handling. This means only the management of the company concerned can best determine its own requirements.

There are cases on record that show that the bewildering speed and capabilities of general purpose computers have led to a complete reorganization of procedures to the extent of including reports proved to be unnecessary or unworthy of the effort.

At the same time it must be remembered that the inherent possibilities of electronic equipment cannot be overlooked. Traditional practices have a tendency to become accepted so that subconsciously they are not open to question. It is not uncommon for an organization to be geared to receiving reports one or two weeks late, and at infrequent intervals, simply because faster and more frequent reports were not considered feasible.

This boils down to the point that the nature of data handling requirements ultimately determines the type of equipment necessary. Since equipment is available to process any data business may require, it is essential that a proper system analysis be made and paper work requirements be determined to limit acquisition to specific electronic equipment to do the job at hand.

## Sources and destination

The first step is a thorough and detailed analysis of information flow. The study must show the sources and destination of information; the visual forms of reports, the type of recording devices used and the nature of the computation required on individual file records as well as the information required on summary reports. The maximum number of records in the total file and the ratio of records processed to the total number must also be determined.

With this information, it is possible to approximate the size and functional requirements of the electronic equipment. In effect, these can be compared to existing file records and data handling equipment.

A file record may consist of a printed record form or a punched card filed according to a predetermined sequence. In an electronic system information is permanently stored on a magnetic drum or a magnetic tape, arranged serially according to a similarly predetermined sequence. (Depending upon the nature of the business requirements, the information might also be stored on punched cards, a printed record, or on punched paper tape.)

The advantage of the electronic system is that an extremely large number of file records can be stored in less space and is much more readily accessible.

Commercial data processing can be divided into the two well-defined categories of data handling and computation. Nearly all business problems involve the handling of large amounts of file data with relatively simple computations. Clarifying the distinction between these two processes will reveal how EDP equipment fits into the picture.

## Handling the record

Consider the accounts receivable file of a large company which has several hundred thousand customers. One day's transactions may involve only several hundred customers. To post the day's transactions to the individual accounts, the individual record cards must first be removed from the file and, after posting, be returned to the file. From time to time a summary of overdue accounts is needed. Those cards showing balances outstanding for more than a specified period must be selected from the main file and a list of the accounts is made.

The data handling features of this operation are those which involve handling the record in its entirety—such as selecting specific records from the file, arranging these records in a predetermined sequence and collating or merging file records with a main file after they have been updated.

Conversion of data from one type of record to another (punched card to tape, perforated tape to magnetic tape) can also be listed in this category.

Computing operations affect certain parts of a record and not the record as a whole. Examples would be correcting the balance in an accounts receivable file record to reflect a new shipment to the customer, correcting the address of a customer who has moved, or increasing the stock balance in an inventory file record to reflect receipt or a shipment of goods.

Just as the percentage of the total file records which are handled in one day's operation determine the percentage of time of the clerical staff apportioned to this activity, so does this determine the relative time devoted to selecting file records from the main tape file. (It is important to note that "selecting" a given file record or records from a main magnetic tape file does not mean the physical removal or destruction of the main file records. The desired file record is merely copied onto an updating file tape.)

## Repetitive requirements

Similarly, just as the nature of entries made and the type of arithmetic operations determine the type of mechanical computation equipment, so they should determine the arithmetic capabilities of the electronic equipment. Unlike scientific and engineering problems, most business problems require repetitive applications of the same arithmetic operation. Accounts receivable, for example,

may simply require addition or subtraction.

With an analysis of requirements available as a guide, it is then up to management to study the merits of general purpose computers and the special data handling equipment to determine which of these is best suited for the application at hand.

It is accepted that general purpose computers can perform many different types of arithmetic operations, such as addition, subtraction, multiplication and division, and they are also capable of automatically making logical decisions based on the results of previous calculations.

This versatility is made possible by the inclusion of electronic arithmetic units, complex control circuitry and storage or memory features which retain instructions as well as data.

The range of problems which a general purpose computer is capable of solving is very wide. When a particular problem is to be solved, however, a special routine consisting of numerous individual instructions must be entered into the computer memory. Once the instructions or program is fed into the system, the push of a button is all that is required for completing the routine.

## Versatility comes high

The process of constructing a program for a particular problem, however, is a laborious one taking a staff of highly skilled programmers many months to complete in most cases. For this reason it is usually suggested that the programming staff be hired months or even more than a year in advance of the actual installation.

This dependence upon programmers and the very versatility of general purpose computers brings up several considerations which must be examined.

For one point, the price of versatility comes high. As it was stated earlier, computers were originally designed to handle the complex arithmetic operations which were fundamental requirements of scientific applications. Most business data processing requires a large amount of data handling (selecting, sorting and the like) and repetitive use of relatively simple arithmetic. This means it is worth considering whether or not a general purpose system will deliver more capability than can be utilized—at high cost.

It is a fact that a general purpose computer operates at low efficiency in many of the sequencing, collating and updating operations. Furthermore, it is a matter of record that more than one company has installed a computer for the purpose of processing business data only to shift to scientific application afterward because it was more feasible. These firms were fortunate to have an efficient use for the computer.

There is also the fact that programming talent is sometimes difficult to obtain, and in most cases expensive. Recognition of this problem has led to the development of automatic programming systems, especially in scientific computation. The same techniques are being applied to commercial problems, but the progress here is still slow.

## Facing a "tight program"

Still another consideration, and somewhat of a paradox, is that the very versatility of the general purpose computer which requires programming also gives rise to a rigidity which can be extremely annoying. Expensive equipment leads management to demand a great deal of performance. This requires skillful programming. When this is achieved the user can find himself faced with a different problem—changes in the system.

These changes in accounting or data gathering, as in everything else, are inevitable. Every change, no matter how small, also requires a program change. Furthermore, while general requirements are well-defined and do not change very often, the ability to get an occasional non-standard report or statistical summary—or to introduce another category into the descriptive material accompanying such items—is very desireable but unlikely if it means modifying an already "tight" program.

There is a final point to consider. In any system involving a general purpose computer, the actual data modification must go through the central processor. Should a bottleneck develop in some stage of the data processing operation, it is likely that the entire system might have to be duplicated.

None of these points should be taken to indicate that the general purpose computer does not have an important role to play. In spite of the complexity and cost, the computer is an economical instrument—when used on procedures requiring a multiplicity of types of calculations, a complex arrangement of varied sequences of operations and a choice of many types of routines.

## A number of passes

This is where special purpose equipment comes into the picture. Instead of taking raw data and accomplishing all of the required modifications in a single pass of the main file, a number of passes of the data are made. During each pass, a single function is performed. This naturally means a simplification of approach to the problem. The equipment is tailored to the requirements of a particular business. A given function may involve a combination of arithmetic and logical operations such as addition, comparison and selection. Another function may include multiplication and division.

The difference between this approach and that

of the general purpose computer might be compared to the difference between a handicraft and a belt-line assembly line.

A general purpose computer can be likened to a skilled mechanic who is versatile and intelligent enough to recognize the various parts of a complete unit, and who can perform all the manipulations and operations required to assemble all the parts into one functional whole. This intelligence and versatility can be carried one step further to the ability to even assemble various types of units.

### Under plugboard control

The special purpose data processor, on the other hand, is designed along the lines of belt-line assembly. It presupposes a careful analysis and organization of data, so that the basic routines and subroutines, as well as the computations, are known. A certain amount of flexibility and versatility are included so that during a given pass (this is the equivalent of a run-through of file records) a given fixed routine or function will be carried out. A different routine can be followed by another pass—by resetting of a plugboard.

To picture this, assume the system has been designed to carry out the process of sales analysis and make certain reports available. The basic input data consists of a random collection of unit transactions on punched cards, pin-tag tickets or perforated tape. The first operation would involve reading from the cards, rearranging the data thereon and writing it on magnetic tape.

The next operation results in sorting the data into sequential order determined by the filing system of the main record file, so that a serially sequenced updating tape is now available.

As a result of a single pass of the main tape file against the updating tape file, two new tapes are produced. One is a completely updated main file, and the other contains a number of different types of summaries required by management. Finally the main updated file or the summary file was mounted on a unit which prints out the data in the form required.

The number and types of operations performed during a given pass are controlled by a simple plugboard similar to that of a punched card system. Depending upon the variety and number of stock items and the type of reports required by management, it may be desireable to maintain several types of main files. If each type of file requires different routines, this may be accomplished under control of the plugboard.

The "program" control of the plugboard can be handled by personnel with the same level of technical training as is required for operation of a punched card installation.

One of the basic savings in initial cost of the special data handling system over a general purpose computer results from the inclusion of only that electronic equipment required for the job. This naturally brings up the question of expandability.

### An expanding advantage

A properly designed system should be capable of meeting a system and user's requirements as they increase. Most file maintenance problems do not require the ability to multiply and divide. A sequencing-updating unit is sufficient to perform the file maintenance function. In the future it may become desireable to add statistical analysis or payroll problems to the file maintenance equipment requiring an electronic multiplying-dividing unit. It is possible to add such units without affecting the existing equipment.

The expandability of special purpose equipment offers three advantages. One, the initial cost is less. Two, when expansion is necessary, the latest equipment developed is available; and three, whenever a bottleneck in the processing appears, specific pieces of existing equipment can be duplicated without paying for a complete system.

In most cases, when the system involves a general purpose computer, where the actual data modification process must go through the central

**next month . . .**

## Two Years Of Automation

An MBA report on the results of two years of automation at the Farmers Insurance Group of Los Angeles, Calif.

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## Data Processing And the Small Business

Data Processing is not strictly for the "big boys." Read how scores of systems designed specifically for small operations can bring substantial savings to small business.

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computation unit, it is generally necessary to acquire the entire complex equipment.

Here, then, are the key questions which management should ask and answer before making any decision in selecting an electronic data processing system:

What is the cost of the basic processing equipment? (No point is made here to discuss the advantages of lease or outright purchase since the decision rests in the sphere of the cost accountant)

What peripheral equipment is required to make the system compatible with existing equipment?

What environmental modifications will be required? Will there be a need for air conditioning, for changes in space requirements, for increased floor strength?

## A programming staff?

What are the initial staff costs? Will the move require training for a clerical staff? Will the size of the staff be noticeably increased? Is a programming staff needed? How large will this group be? To what extent will maintenance and servicing personnel be required?

If a general purpose computer is selected, to what extent will the company be paying now for future potential or for capability which is not now required?

If special purpose equipment is selected, to what extent will standard modular units be used so that initial costs are kept to a minimum and replacement parts are readily obtainable?

Will the entire system have to be duplicated in the future or will it be possible to add only those features required by specific bottlenecks in data processing operations?

What will the limitations of the equipment be in respect to input, output, storage capacity and speed?

Can units be added without affecting the existing system?

Can advantage be taken of advances and new developments which are announced by the industry in ever-growing number?

If a general purpose computer is installed, will the programming staff from outside of the company be interposed between management and EDP? Will their lack of intimate, first-hand knowledge of the company influence management's judgement and control?

With these questions answered in detail, the picture should take a more positive shape. Perhaps there is no single source available that can spell out all of the advantages or disadvantages of either system for any particular business, but the ideas expressed here can at least act as a springboard for those who are charged with the responsibility of selecting an electronic system. ■

Orders at Minneapolis-Honeywell's Chicago office are written automatically from common-language information held in VISIrecord visible files shown above. These operators (four altogether) can process up to 400 orders in a single day.

# *Automatic Writing Speeds Order Processing*

**Costs are cut by using a tape and card file "pool" of prewritten information.**

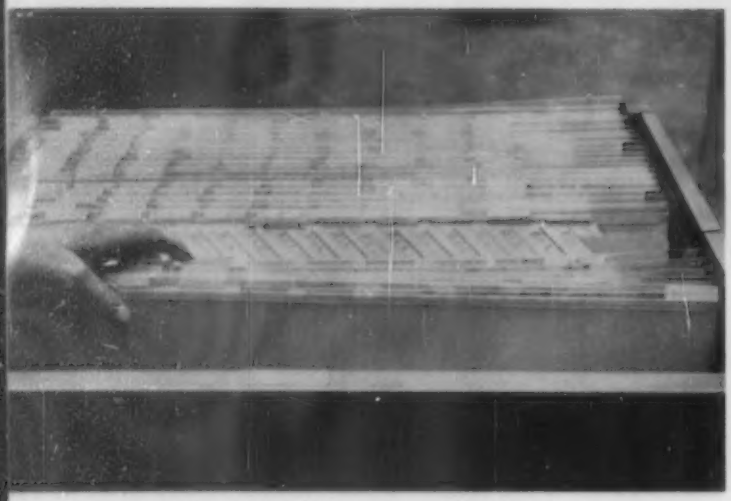
PRODUCT complexity and variations needn't be stumbling blocks in developing automated order-processing procedures.

This was substantiated at the Chicago factory of the Minneapolis-Honeywell Regulator Co. when a system to handle orders for pneumatic controls used in ventilating and air-conditioning equipment was successfully put into operation.

The automated system has reduced order-processing costs by 28 percent and made possible a new scope of statistical data for prediction of production requirements, sales analysis, and the tightening of inventory controls.

A large portion of the factory's business is in specially-designed units sold on an installed basis and built to specifications. The variations of the product line are endless. Inner valve construction will vary for each medium that will be used—superheated or normal steam, hot or chilled water, air, gas, etc. And for each of these, construction changes are necessary for the various pressures that will be encountered.

The factory is one of the nation's largest facilities for these pneumatic controls. An average of 200 orders a day—with peak loads up to 400



Required information is selected from visible index at operator's side without waste motion. A special code number speeds selection.

Master customer and repetitive-phrase tapes are pulled from the pocket card without removing the card from the tray unit.

L. H. Hoye was manager of the order department when the system was installed. He has recently been promoted to Minneapolis in the Datamatic Division of M-H.

a day—are received. The majority are from the company's field branches, but others are received directly from equipment manufacturers who use the controls and components in their products as well as from customers seeking replacement and repair parts.

Although many orders call for immediate delivery, others may request delivery a year or more from the order date. As a result, in addition to product complexity, the company must deal with varying shipment requirements, considerable back ordering of units to be built to specifications and also frequent post-order engineering changes.

An integrated data processing system for the orders has been made possible through the creation of a central pool of order information—prewritten in common machine language form. Nearly 5,000 product cards, more than 1,000 customer tapes and numerous special-entry tapes are available for automatic processing.

## Common-language is vital

According to L. H. Hoye, order department manager, the success of the entire system hinges on the immediate availability of this common-language information at all times. Delays in searching out or re-filing tapes and cards can seriously cut into the efficiency of the IDP equipment, so the company assured itself of rapid access to this "pool" of prewritten information by maintaining the cards and tapes in visible-vertical files. These files give operators immediate access to necessary data when an order comes into the office.

Once the order has been received and edited, it is processed by one of four operators working at Friden Flexowriters, tape-reading-and-punching automatic typewriters. Each operator has, at her side, a VISIrecord, Inc. tray unit containing all the necessary information on common-language tapes and cards.

The use of these common-language media is vital to the system, for there is a tremendous range of information contained in the files.

A typical header tape, for example, includes customer name and address; sales contract, if applicable; sales code; routing code; renegotiation code for government orders; a program code to

Operator places one of two tapes produced in automatic writing into the control card included in the five-part order set.

Transaction tape is converted to punched cards for machine accounting purposes. The cards are then duplicated for an open order file and inventory use.

select data for statistical purposes; and any special instructions peculiar to that customer.

There is also an edge-punched card available in the file for each product. A typical card includes the numeric catalog code (translated from an alpha-numeric catalog number of up to 14 digits so that it can be handled by tabulating equipment), item description, brief specifications to guide the installer on the job site when he receives the material, and stop codes for entry of variable information. Because most orders are received from branch field offices and are handled on an inventory basis, prices are not included in these cards.

However, for replacement parts cards which go to OEM customers (Original Equipment Manufacturer) the prices are included. In addition, a separate visible-vertical file is maintained for products which normally do not demand repetitive business but which may be reordered in the future.

## A quick search

The files also hold tapes or cards for common repetitive phrases which are used in the orders. These may include certification statements required by the government, export order phrases or phrases for use when state or city taxes are itemized. Both tape-pocket cards and edge-punched cards have been specially designed by VISIrecord for use in the filing units.

The combination of automatic writing and high-speed filing provides the mechanical backbone of the system. Product cards, for instance, are grouped by product type, with catalog number digits indicating type in red printing on the second line of the index area. The variations of products within each type are indicated by four or five digits in blue pencil on the top line of the index area, so in effect, the operator searches only for the four or five-digit variation code rather than the 14-digit catalog number.

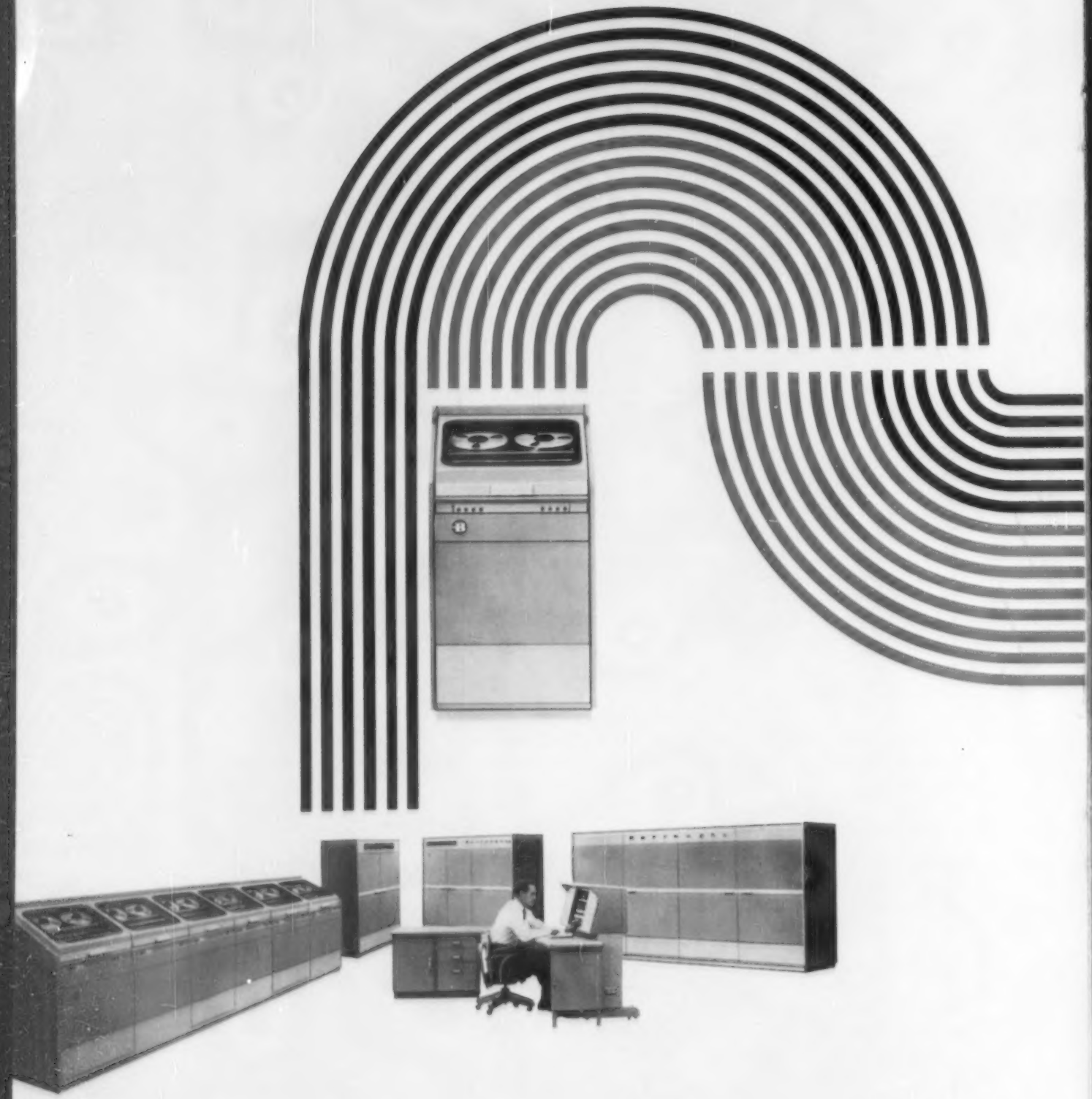
This means little wasted time in obtaining the card, and when it is pulled, an "out" signal appears on the card shingled behind it. This means it can be returned as quickly when the operator is through with it.

The tapes can be pulled from the pocket cards without removing the cards. They, and the item cards, are then used in the Flexowriter to produce a five-part Standard Register Co. continuous order set. The only manual entries required are for variables such as customer order number, dates of entry and requirement, quantity and other non-repetitive facts which may be required in special cases.

The forms that are typed include a "proof copy" for visual proof reading of variables and card selection; a "register card," on light card stock which is perforated for stripping down before it is placed in a record file; and three others, corner-stapled to move as a separate set. These are the "acknowledgement copy," a "followup copy" used by allocation personnel to check on availability of material and shipping promises, and a "control card."

During the typing operation, the Flexowriter produces two tapes. One is a selective tape prepared by an auxiliary punch to be used by the machine accounting department for statistical purposes. The other contains all order information

*Continued on Page* 30





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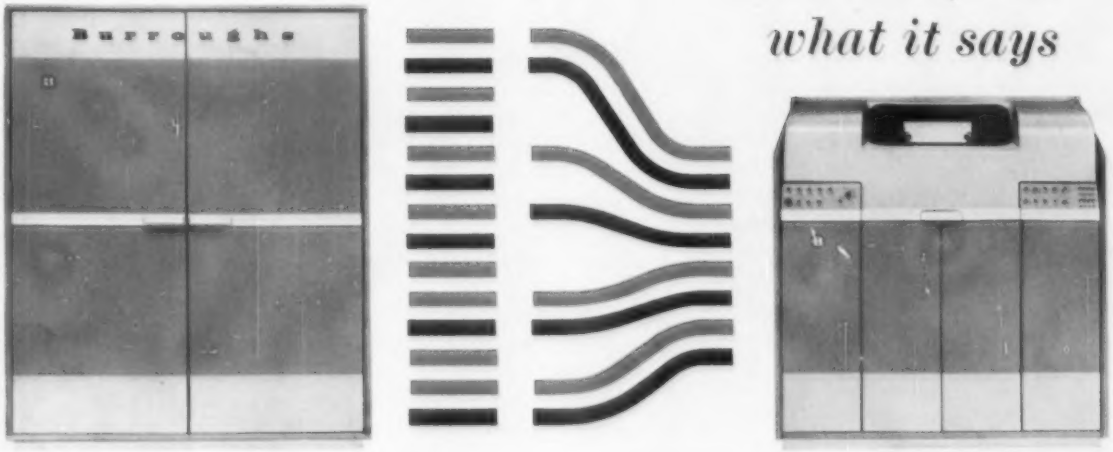


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## *Automatic Writing*

Continued from Page 27

and is used later to write shipping papers automatically. This second tape is placed in a pocket built into the "control card" copy of the form set.

The statistical tape is then processed through an IBM tape-to-card converter to produce a punched card for each item that has been ordered. These cards are then duplicated so that machine accounting can maintain a complete card file of open orders. With the cards, order analysis can be done as required with an hour's notice. Normally this is a weekly chore.

### An added bonus

The other deck of cards, meanwhile, has been returned to the order department. Here they are kept on file, with a written record of the number available or backlogged for each item. As the individual items are allocated for shipment, cards representing each item are removed from this file and taken to an open order file where the control card copy has been held. This copy contains a typed record of the order on its face, a complete punched tape in one pocket, and the cards for items to be shipped in another pocket.

"I was trying to straighten out my wife's bank account!"

When all the material is on hand to complete an order the control card is returned to a Flexowriter operator who uses the tape to type an invoice and shipping set, completely automatically.

With all of the information that is available via the routine machine accounting department operating procedure, the only thing lacking for a complete inventory system is incoming stock, Hoye stated. To obtain this, the stockroom's "move tickets" are routed to a Flexowriter operator each day. She selects the product cards indicated (from her file) and creates a tape and proof copy representing incoming stock. The tape is then converted to punched-card form.

Machine accounting is now able to provide the order department with a completely automatic machine report on perpetual inventory status. This has eliminated the need for a separate inventory record in the order department. There is also the added bonus of an inventory report and a complete, machine-printed report of activity available each week.

As was stated earlier, management feels these reports, and the capability of the system for putting order information into machine language, almost equal in value the reduced processing costs. This statistical information is a byproduct, yet it is considered to be of real value because of the speed with which it is produced and the economy of the operation.

### Hurdling a bottleneck

The tape produced during the order-writing is analyzed for business within customer markets at various times of the year. Reports now give past-due requirements and pin-point future requirements by date and period, both immediate and long-range. This information has helped the company to plan future production accurately despite the special nature of its products.

The value of this reporting ability, Hoye added, is remarkable in view of the fact that it is accomplished with a system which cost much less than a previous system employed. This previous system, at higher cost, could not produce the statistics.

The 28 percent reduction in the processing costs-per-order figure mentioned previously, which does not include the cost of equipment which has been released or the added value of reporting capabilities, represented enough savings on the present order volume to enable the system to pay for itself within six months, Hoye concluded.

A combination of easily accessible files, tape and card producing equipment and a well-designed procedure has helped Minneapolis-Honeywell Regulator to hurdle what had been considered a serious bottleneck in its IDP set up. ■

**An MBA**
**Product Preview**

The Electronic Datatyper, a completely automatic, single character embossing machine which can operate at speeds up to 14,000 characters per hour, producing plastic credit cards, address plates or other embossed identification tags.

# *Dashew Unveils Datatyper-410 Embosser*

DASHEW Business Machines, Culver City, Calif., has introduced the Electronic Datatyper-410, a completely automatic, single-character embossing machine.

The Datatyper, fastest device of its type now available, has an average operating speed of 14,000 characters per hour. It produces plastic credit cards, address plates, or special embossed identification tags such as those used on industrial equipment and supplies or by the Armed Forces for materials being shipped overseas.

In application where plastic cards are desired, the Datatyper can be furnished with an attachment which automatically adds colored tipping to the raised face of the characters for easy legibility.

This is the first machine of its class that can operate from an output of punched cards as well as punched tape. Both key punch machines and tape readers are optional input devices. The machine is believed to be the first of its type capable of handling stainless steel plates.

An electronic servo-drive system is responsible for the high speed of the Datatyper. The key to both speed and silence (it is said to be the most quiet embossing machine yet devised) is a unique type of wheel punching mechanism developed especially for Dashew. There are no clutches, brakes or mechanical drives of any type.

Internal programming capabilities of the machine make it possible to imprint embossed plates in virtually any desired sequence. For example, a punched card could have a name punched in columns that preceed the account number. The Datatyper will also emboss the name first, in the second line position of the credit card, and then it will shuttle the card to the top line to pick up the account number. It is easily adjustable to accommodate plates of any size from three by five inches down to one-quarter-inch strips.

In processing plates, the Datatyper can be set up to assign and emboss sequenced numbers to plates, completely automatically. It will also emboss special characters on programmed signals (an example: expiration dates on credit cards) or it can enter special symbols which indicate credit limits. Where more than one plate of a kind is desired, the Electronic Datatyper will emboss the additional units automatically, remembering and repeating the program internally. Circle No. 9-17

**Serving nearly half of all the families in the United States, the Speery and Hutchinson Co. relies on a high-speed integrated data processing system to keep its redemption stores well-stocked.**

# *Automation— A 'Redeeming' Factor At S&H*

GIVE the lady what she wants when she wants it.

This is the underlying philosophy which has boomed the 62-year-old Sperry & Hutchinson Co. —creators of the famed Green Stamps—to a place of prominence on the American merchandising scene.

To better serve its 23½ million housewife customers, S&H has turned to automation to keep the merchandise pipeline filled and flowing to all of its 570 redemption stores scattered throughout the country.

"Something for something" is what the housewife gets when she brings books of trading stamps to these stores, and today she seldom will find the item of her choice "temporarily out of stock."

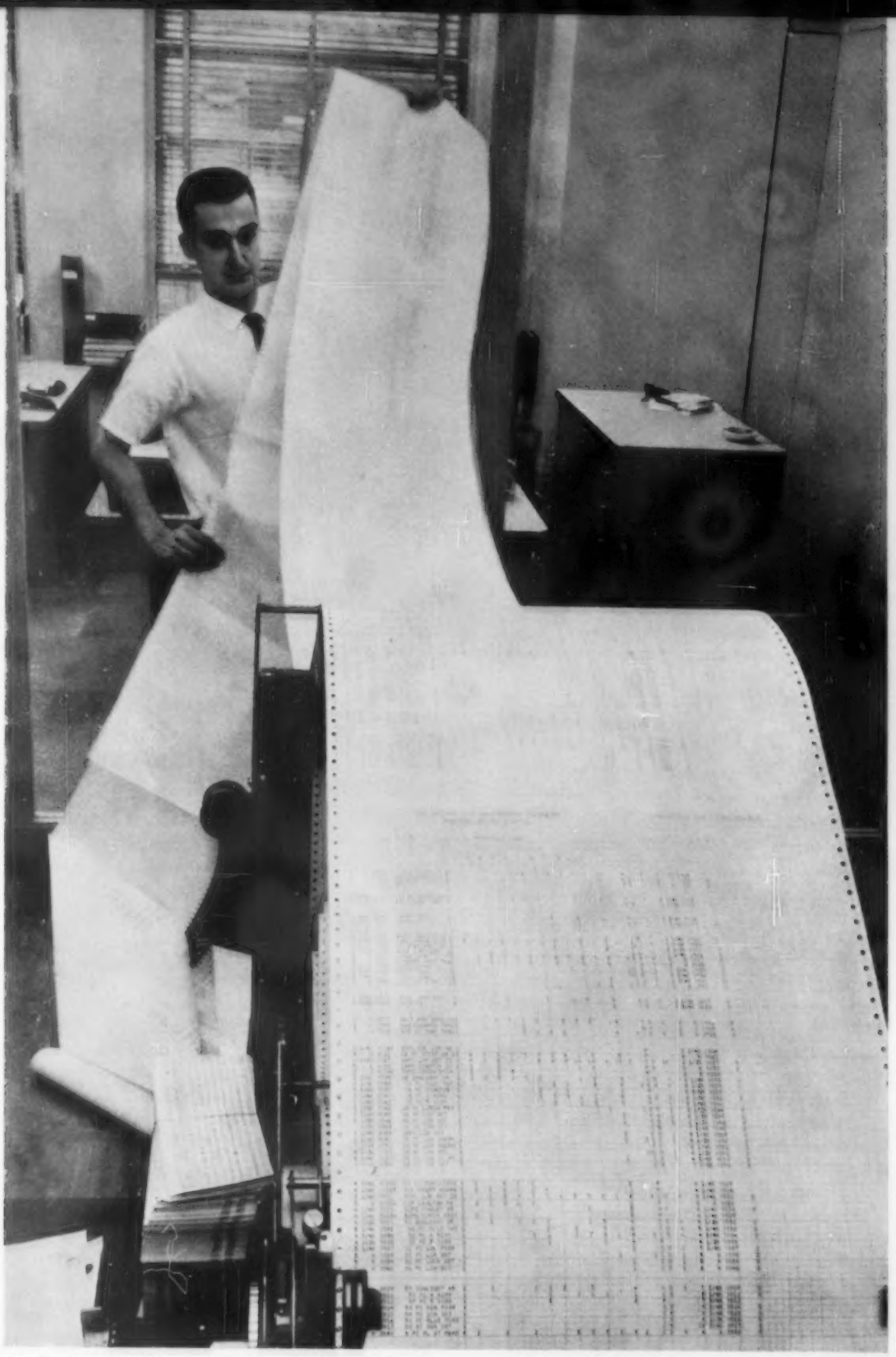
A new system makes possible the speedy regulating of the inventory levels at each redemption outlet and allows for weekly adjustments of the huge S&H inventory—1,500 different items representing some 30 million pieces of merchandise —carried at nine distribution centers strategically located from coast to coast.

The company has invested millions of dollars in these warehouse distributing centers and in detailed control systems, including two electronic computers, to assure the prompt service the "customer" expects.

A data processing center, located in the firm's New York City headquarters, is linked with a data relay station in each warehouse by means of a Western Union private wire network. The warehouses, situated in Natick, Mass.; Metuchen, N.J.; Chicago; Lincoln, Neb.; Atlanta; Fort Worth; Los Angeles; San Francisco; and Portland, Ore., service the redemption outlets in their areas.

Each week the outlet manager submits a report to the warehouse listing the redemption activity for the week on each of the 1,500 items on stock. The report is made on a preprinted form which contains a code number identification for each item. At the warehouse data relay station, an operator obtains code and quantity totals simultaneously on a Monroe Dual adding machine equipped with a split keyboard. These totals establish controls on both the merchandise codes and the quantities redeemed.

The report and control totals are then prepared for data transmission by an operator using a Synchro-Monroe adding and punching machine,



Stock status report for one of the redemption stores respresents a 70-foot-long inventory report; is prepared weekly from computer output cards.

Responsible for S&H computer program are, left to right, Stan Gordon, computer control supervisor; John Ryerson, computer methods analyst; Harold Starer, computer operation coordinator, and Richard J. Reynolds, Jr., assistant controller.

one of the key components of the S&H automation system. This machine verifies the correctness of the redemption report totals, provides a five-channel punched tape for wire transmittal to the data processing headquarters and also produces an adding machine tape for checking purposes.

## Inventory is on the level

Using the same machine, the operator codes the transmittal tape to identify the redemption store and week-ending date. The data is then forwarded by wire to the processing center along with an administration message which contains the control totals for the inventory record.

Once the tape is received in New York, it is immediately converted into punched cards which, in turn, are tabulated for totals. A check is made against the control totals to assure that no data has been lost in transmission, and the cards are then assembled for processing through the center's IBM 650 computer system.

While this is taking place, a copy of the outlet manager's report has been sent to the district merchandise manager who is responsible for inventory levels at the various outlets in his territory. Each district manager handles some 20 to 25 outlet stores. Taking the weekly outlet redemption report, he determines what, if any, level adjustments are necessary for each item. Adjustments are normally dictated by seasons; certain items are more popular as Christmas or wedding gifts, and others—such as lawn chairs and barbecue grills—are warm weather favorites. There are also the usual changes in the taste of the housewives as different items become fashion or fad. If adjustment is necessary, the manager lists the new quantity level alongside the item involved.

This merchandise level report is then processed at the data relay station in the same manner as the redemption report. It is transmitted to New York by wire and there converted to cards. The data processing center maintains a "level" file of cards—by item, by store. "Level change" cards are used to update this file before proceeding with the final weekly processing. A second card file, which contains individual store inventory status for each item, is also maintained at the center. The updated level file cards are combined with the store inventory cards and the weekly redemption cards and then fed to the 650 computer.

## Computer gives the facts

The computer operation reduces the item inventory card by the number of redemptions for that week, punching out a new current inventory card. At the same time, the computer compares the inventory quantity with the level figure, and if the latter figure is lower, it punches out an "order" card for the quantity necessary to bring the two into balance.

The order cards, in turn, are converted to tape and transmitted back over the wire network to the data relay stations at the distributing warehouses. The merchandise orders are received at

Key component in the S&H data processing system is the Synchro-Monroe machine which converts inventory to a five-channel tape for transmission to the New York headquarters over leased Western Union wire network. The machines are located at each of the nine data relay stations.

the station on a teleprinter equipped with continuous multiple order forms, and within a few hours, the merchandise is on its way to the outlet stores.

The new system is a tremendous improvement over the former system used by the company. Richard J. Reynolds, Jr., assistant controller, pointed out that in the past the method had been both cumbersome and time-consuming. Manually prepared reports were sent into headquarters by mail from each redemption store. They were then checked and sent to the tabulating department for key-punching and verification. They were next processed through conventional IBM equipment.

"We could tell which items were needed, where, and at what time, only after our tabulating department had the basic facts to work with," Reynolds said.

"This prevented us from getting the information as fast as it was needed and it also tied up personnel in repetitious manual key-punching operations," Reynolds pointed out.

Now S&H headquarters gets verified data from the redemption stores swiftly, accurately and in

Tapes are converted to cards at the New York data processing center. After verification of totals the cards are fed into computer system to up-date inventory for each redemption store.

pre-digested form, so that it can be immediately and automatically absorbed by the data processing center. Decisions are now based on facts. Instead of averages or approximations, the company knows the exact, machine-verified quantity of each item in each store.

## Green Stamps for a 702

The small green stamp, created 63 years ago by Thomas A. Sperry and Shelley B. Hutchinson, is saved today by more than 20 million American families. More than 60,000 merchants in 47 states are issuing the stamps to help win and maintain their share of business. But S&H, with over 5,000 employes, is not resting on its laurels. Executive vice president Frank Rossi emphasizes that the company is determined to take on still a greater share of the expanding market for trading stamps.

He believes that keeping ahead of competition means making improvements wherever possible. And, in the field of communications and data processing, these improvements are coming fast at S&H. Even now, a whole new area at the New York headquarters is being readied to accommodate a new computer, the giant IBM 702. The possibilities of this new equipment have excited the entire organization.

While it takes 23 minutes to process the average redemption store's inventory on the 650, it will take only three minutes on the 702. But, Mr. Rossi points out, even though the new machines will handle a tremendous amount of work, he can see nothing but greater job opportunities for all S&H employes.

With over half of all the families in the United States as customers, and with approximately 95 percent of all stamps issued being redeemed (there is a direct relationship between high redemption rates and increased sales at stores issuing stamps) it would appear that Mr. Rossi has made a reasonable assumption. ■

## *Magnetic Ink*

Continued from Page 19

at the GE laboratories in Palo Alto, Calif. that a move to magnetics was worthy of serious consideration. True, it represented a giant step in comparison to a decision to accept one of the better known systems, but we felt that any other system would, like the "tronics", only be a temporary solution. This obviously meant that our customers would first be asked to adjust to a punched card system and then later to still another method of operation. We rejected the "crawl first" idea and concentrated all efforts on a magnetic ink system.

GE, one of the pioneers in character sensing, had developed MICR equipment in conjunction with the Bank of America, and after viewing this equipment in action and through close association with the Bank of America personnel responsible for the MICR project, we felt confident that magnetics was the solution for Merchandise. Accordingly, we recommended the system to the bank's board of directors.

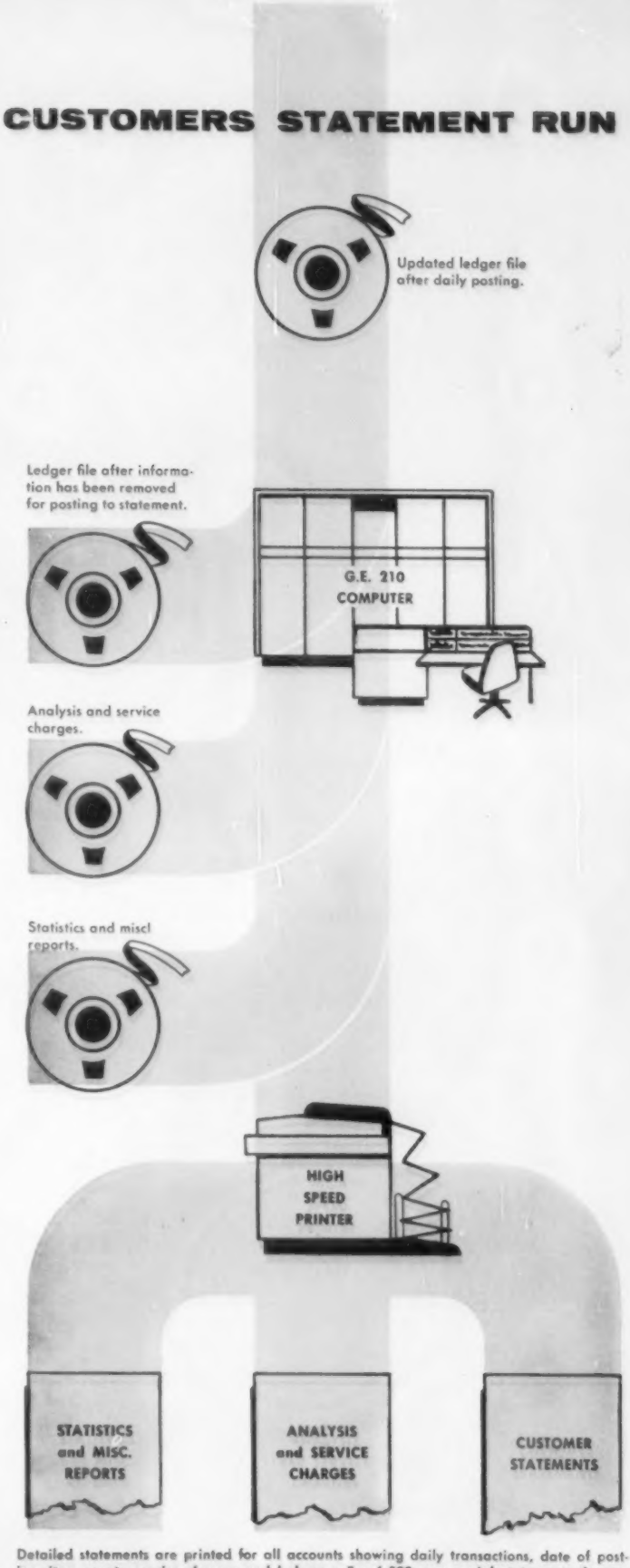
*What was the Board's reaction to this rather revolutionary proposal?*

Mr. Tubergen: President DuVall and several members of the board journeyed to the GE computer headquarters in Phoenix to take a first-hand look at the developments in magnetic ink character recognition. Upon their return, they gave our recommendation a unanimous vote of confidence.

On December 28, 1958, we signed a contract with GE for a 210 computer system. It should be emphasized that the 210, as such, was nonexistent at the time. However, the equipment already developed, and operating, which would be similar to the 210, and the tremendous research program and facilities of GE—plus their years of electronic know-how—was enough evidence for us and our management to expect the 210 to soon be an operating reality.

*Once the study was completed and equipment determined, what was the next step in preparation for the new system?*

Mr. Tubergen: The next step concerned people. A notice was sent to all employes informing them of the bank's decision to automate. Naturally, any change in an existing system will start rumors flying about possible loss of jobs. We thought it best to present all the facts directly to the employes. We told them that, in our judgment, the new system would result in a reduction of some 36 people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Statistics and misc reports.
HIGH SPEED PRINTER
STATISTICS and MISC. REPORTS
ANALYSIS and SERVICE CHARGES
CUSTOMER STATEMENTS

Detailed statements are printed for all accounts showing daily transactions, date of posting, item counts, service charges and balances. For 6,500 commercial statements the run will take 4½ hours. For 6,000 special checking statements, 2½ hours.

GE technician puts the document handler through exhaustive tests before machine is released for shipment to customer. A high-speed printer, not visible in this picture, is linked to the GE-210 computer to list test documents for accuracy check.

Experts from GE's programming department are shown here seated at the computer console as they give the final tests to magnetic tape units shown in the background. Each unit is thoroughly checked against actual operating conditions before release from the plant.

## System Components

The major units associated with the GE-210 Data Processing System are:

(a) Document handler — including magnetic character reader and control circuits.

(b) GE-210 Computer — including its associated control unit, console, power supply and motor alternator.

(c) Magnetic tape units.

(d) High-speed lister.

The document handler (sorter) is an electro-mechanical device which is four feet wide, 15 feet long and four feet high. Its principal function is to provide a means of feeding information at the rate of 750 items per minute into the system and to sequence checks into any one of its 12 pockets in some predetermined order.

The GE-210 is a high-speed, magnetic drum computer. It is an alpha-numeric, stored program machine with a 4096-word magnetic drum memory and two 64-word magnetic core buffers. Inputs are document handlers, magnetic tape and photo readers. Outputs are magnetic tape and high-speed listers.

The magnetic tape units have a reading and writing speed of 30,000 numeric characters per second, and 15,000 alphabetic characters per second. Each 10-inch reel will contain some 3,600 feet of tape.

The high-speed lister can print up to 96 columns of data at a speed of 750 lines per minute.

*(Price range of the GE-210 is $450,000 to $600,000 on purchase, with a monthly rental range from $9,400 to $15,000, depending upon the units in the building-block system.)*

from the payroll. We gave them the approximate timetable for the changeover and assured them that all who were affected by the new system would either be offered other positions at Merchandise or would be guaranteed a position at neighboring banks.

*How did you go about selecting programming help for the new system?*

Mr. Reiman: First we set up a three-week educational program designed as an elementary introduction to the concepts of the new system.

This program consisted of classes on two nights a week, and all employes, including bank officials, were invited to attend. The program, though strictly voluntary, attracted 90 people. The elementary school was followed by an advanced class which delved into the technical details of the system. Fifteen employes continued in this class. Then, as an experiment, and with their permission, we administered a series of aptitude tests to the fifteen in an effort to determine those of the group who might be inclined toward programming techniques. The tests were conducted by a professional psychologist.

Two members of this group were selected to form the initial programming staff. One was a bookkeeper in special checking, a 20-year-old man with a high school education. The other was a 19-year-old girl who served as a teller in the installment loan department. These two young people are now engaged in the programming effort under my direction and are assisted by a consultant from the GE programming department. We will eventually increase the programming staff.

*Was any special effort made to acquaint the bank's customers with the pending system changes?*

Mr. Tubergen: Yes, a series of promotional letters signed by Mr. DuVall and printed in magnetic ink were sent to all of the bank's check users. These letters, as well as all other promotional material, bore a caricature called "Otto Mation", symbolizing the new electronic data processing system. The letters explained the customer benefits of the new system—better quality of statements, infinite accuracy in every detail connected with the handling of funds, faster-to-fill-out deposit slips and checks—and gave them a preview of the "magnetic" checks.

In addition to the letters, personal calls were (and are currently being) made by bank officials on all of the large commercial checking accounts. They explained, in detail, the potential of the new banking service. The reception by the customers, large and small, has been most enthusiastic.

The reason behind the advanced promotion, of

course, was to get customers to use the new type of "magnetic checks" as soon as possible. As an indication of the success of this effort, over 90 percent of our special checks are already being printed in magnetic ink.

*Does the printing of the "magnetic checks" present any problems to the printing industry?*

Mr. Reiman: Not to those printers whose work is consistent with high quality and close tolerances. In working with our commercial accounts, we have offered our services as a liaison with the customer's printer to assist in the check changeover. This has brought us into contact with many printers, and in general the reaction has been most positive. Our services, and those of GE, are available to the printers of our customers' checks for design and testing. The latter under actual conditions at the GE laboratories.

Actually, personal-type checks can be easily produced on-premise with several of the existing types of off-set equipment. We are producing checks here at Merchandise using a conventional Addressograph-Multigraph 1250 machine equipped with a newly-developed moistening head which provides an even spread and laydown of the magnetic ink. The biggest problem with the printing operation can be charged to lack of proper education. There has simply not been enough accurate knowledge dispersed to the printing industry in regard to magnetics. It is also apparent that some printers, not equipped to perform a quality job or hold close tolerances, are inclined to take a negative attitude toward the entire program.

*What applications will follow demand deposits in the new system?*

Mr. Tubergen: At this point it looks like installment loans, a large paperwork job. Actually, we are looking at this whole program from a "total systems" concept. We feel the entire bank operation can be tied together with this system so that all operating departments can receive daily statements which will give them the exact status of their operations.

*What about site preparation and personnel for the computer operation?*

Mr. Reiman: The equipment is solid state and requires no special air conditioning. We estimate the total cost of site preparation to be under $5,000. A staff of four people will operate the computer system.

*If Magnetic Ink Character Recognition offers an economical solution to the paperwork problems of the banking industry, what are its potentials for other business operations?*

Mr. Reiman: We feel that wherever paper represents the source document for a data processing system, MICR has tremendous possibilities. For example, insurance premium payments, department store charges, credit card applications—most of these operations require a conversion from the source document before the electronic or mechanical processing of data can begin.

Using the credit card as a more specific example, think of the savings obtained if the customer identification, store number and amount of charge are all encoded in magnetic ink, eliminating the key punching of these documents. Utility billing is another area of great possibilities. Even now the development of multiple reading heads for electronic document sorters is underway, meaning that soon any number of lines can be read from one document. This breaks the 80-column barrier for data processing input.

While at times it seems that we are just a little "alone" in this pioneering effort, we cannot help but feel that ultimately the MICR method will be the accepted system for high-speed electronic data processsing. ■


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Circle Reader Service Card No. 9-62

# *Motorola Enters Industrial TV Market*

The young lady serves to demonstrate the clarity of the new Motorola, Inc. TV camera and industrial monitor which are part of a line of equipment to be introduced this fall.

## An MBA Product Preview

THE last quarter of this year will mark the introduction of a line of five new closed-circuit television cameras and two monitors by Motorola, Inc. It also marks the firm's entrance into the educational and industrial TV field.

The basic general purpose camera is available in four versions, providing 550 to 600 lines in horizontal resolution. It weighs approximately 12 lbs. and is only 5½ by 11 by 7 inches, putting out a one volt video signal into a 75 ohm coaxial cable.

The four versions of this unit provide: (1) either automatic light compensation, or, manually controlled compensation; (2) either random-interlace, or, locked-interlace. The automatic models adjust by themselves for variations as much as 200 to one in light levels at the televised scene, making it possible to use the systems in low light areas if necessary.

This also eliminates the need to make adjustments as lighting conditions change, especially suitable if natural light is involved in any way.

In the random-interlace models, picture stability is assured through the use of crystal controlled horizontal sweep circuits, power frequency controlled vertical sweep and well-shaped sync pulses.

The fifth camera in the line is a viewfinder, broadcast quality unit for studio work in elaborate educational or industrial training TV systems.

The industrial monitor has a 14-inch screen with 600-line resolution. The second monitor is a 21-inch model designed especially for educational work and capable of receiving both closed circuit video signals and regular off-the-air broadcast signals. It can also be used as an audio amplifier.

Equipment for the new line includes a complete selection of mounting, optical and distribution accessories to meet all application requirements. The camera uses a standard 16mm/C lens mount and can accommodate a remote control, four-lens turret. Functions such as remote pan and tilt, iris control, focus and zoom lens can be added to the camera. Circle No. 9-18

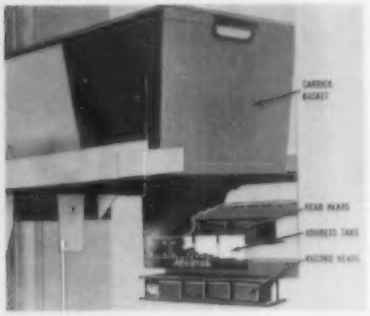
# *MBA Showcase*

**New Products for Business Automation**

## Paper Tape Input Unit

A "piggy back" paper tape unit which allows the Burroughs E101 electronic computer to accept data and instructions from either one of two readers has recently been developed by the company. The Duplex Tape Input Unit is controlled by the pinboard programming unit and when coupled with the Model A531 input unit it increases the E101's versatility by providing automatic control of two tapes. Circle No. 9-1

## Conveyor Control



A new magnetic control has been developed by Maico Electronics, Inc. Working with conveyor systems, "Maitrol" provides selective dispatching to as many as 64 different receiving stations. Warehouse order picking, mail sorting, storing of books in libraries, delivery of mail in banks and multistory office buildings, filing of insurance company policies and record handling in hospitals are among the possibilities of use for the system. A magnetic address, corresponding to the push button pressed by the operator, is impressed on a series of tabs. Read heads pick up only the right unit. Circle No. 9-2

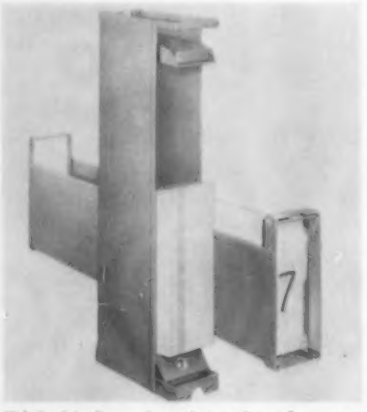
## Electric Collator

The new Halverson Products Co. high-speed electric collating machine can bring together eight sheets per second in operation. Finished sets are stacked automatically by the machine in a criss-cross pattern to afford easy pick-up for stapling, binding or padding. The new heavy-duty unit occupies only 20 by 48 inches of floor space and stands 57 inches high. Its quiet operation makes it suitable for offices. Circle No. 9-3

## Paper Cutter

A paper cutter that can cut a stack of paper two inches thick by 18 inches long has been introduced by Martin Yale, Inc. The Ream Cutter is described as a manual high-ration cutter designed to meet the need for low cost cutting and trimming in offices, printing plants, schools, hospitals and other institutions. A size control handle is said to guarantee accuracy in cutting. There is an automatic handle lock for safety. Circle No. 9-4

## Tab Card Tray




Diebold, Inc., has introduced a new vertical processing tab card tray designed for versatility in speeding up punched card handling. It serves as a storage unit, as a pocket for the sorter rack, as a card carrier and a machine feeder. It has a built-in "automatic angle" to provide efficient card handling when the tray stands on either end. Cards are angled above horizontal plane to prevent spillage from machine vibration. Circle No. 9-5

## Tape Converter

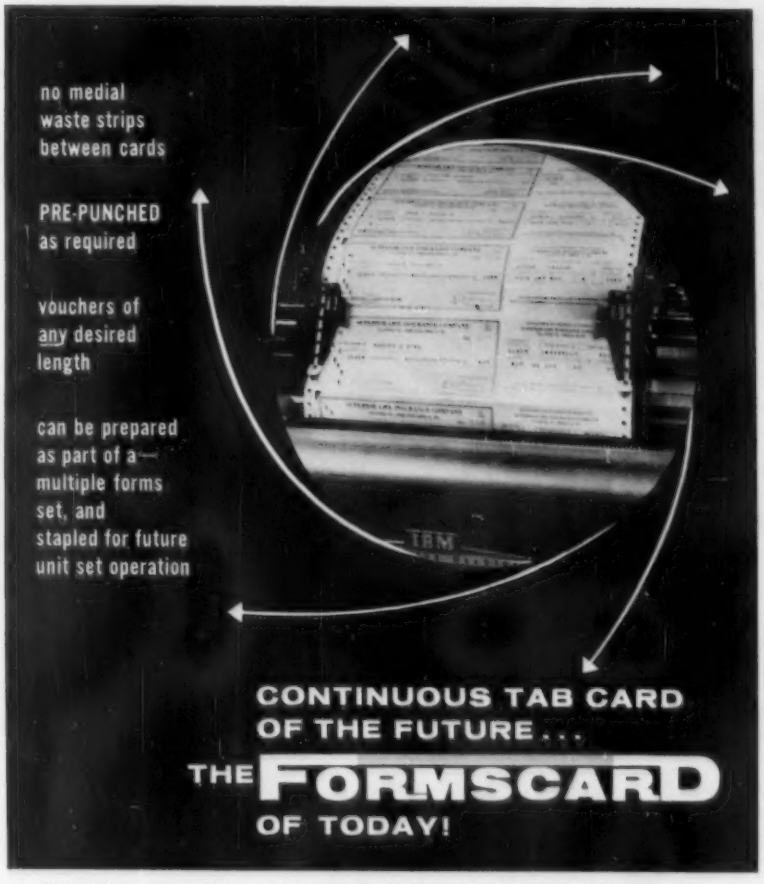
A new converter, which makes it possible to use digital magnetic tape as input to automatic graph plotters and similar votage devices is now manufactured by Benson-Lehner Corp. It eliminates the necessity of transferring data from magnetic tape to punched cards for plotters. Circle No. 9-13

## Spirit Duplicator

Electronic feed is among the main features of the new Standard Duplicating Machines Corp. "Duplicenter." The sheet of paper, advanced casually or quickly, activates the duplicator and the feed device corrects any minor errors in aligning the paper or punched cards. Completed copies are delivered at eye level for checking by the operator. In feeding, the operator has a choice of hand lever or foot control over the master attaching clamp. There is also a micromatic adjustment to permit change in registration if needed. Circle No. 9-7

## Punched Forms Binder

Nylon post binders which permit fast, easy filing of unburst or burst control punched forms are now available from Uarco, Inc. Pages held in the binder are completely exposed for reference, and the entire form may be filled with type matter to save on forms cost. There are no protruding parts on the outside of the covers to give the binders a new flat stacking ability. The posts lock with a single motion and are easy to release. Circle No. 9-12

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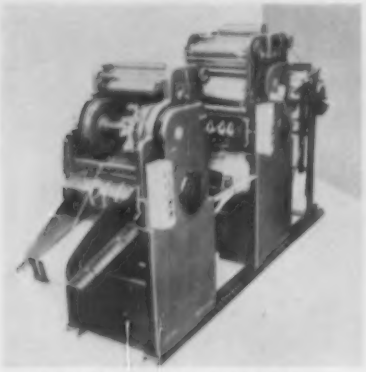
## Tandem Offset Press

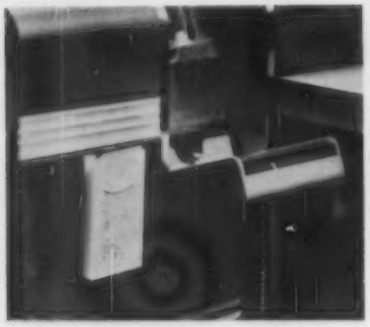


The tandem "Dual-A-Matic" offset press has been set up to handle several operations involved in bank check imprinting. In a series of electronically controlled operations, checks are printed, imprinted, numbered, and perforated in any specified quantity. An auxiliary "piggy back" feeder feeds in deposit slips and check reorder forms after the required number of check forms and stubs have been printed so that the job is completely collated and numbered at the end of the run. The numbers are imprinted on the checks in the E-13B alphabet system for use in magnetic ink sorting. From Davidson Corp. Circle No. 9-10

## Intercoupling System

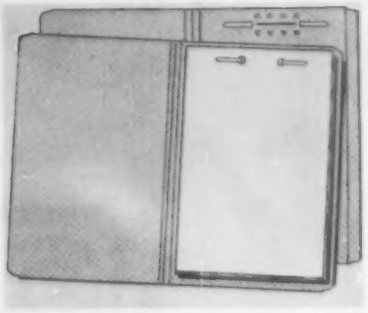
An advanced intercoupling system for the integration of machine accounting and wire communications has been developed by Systematics, Inc. The new equipment permits the automatic transmission of punched card data at 60, 75, or 100 words per minute between locations linked by wire systems. It is applicable to any operation where punched card data must be relayed to control location for recording and analysis, such as in payroll reporting, inventory control or cost accounting. One unit, the input intercoupler, reads the punched card data and activates a teletype transmitter. The information is sent over the wire, and as data is received by a teleprinter in another location, the output intercoupler automatically activates a card punch. The output card duplicates or ignores the transmitted information according to programming requirements. Circle No. 9-15

## Tab Card Holder



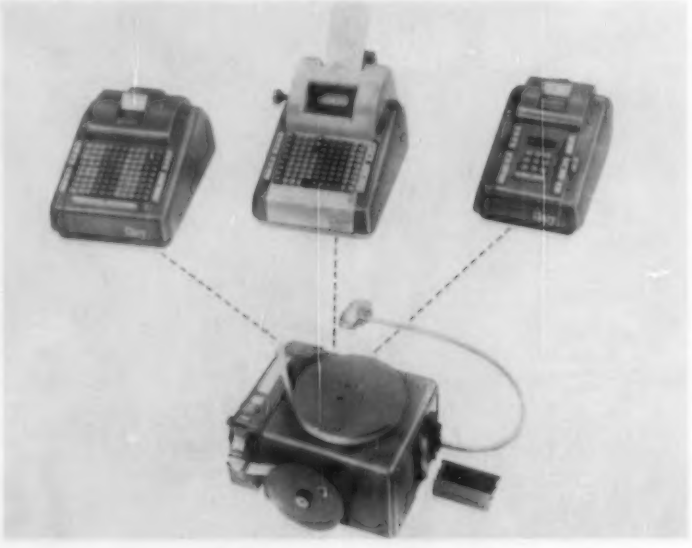
A magnetized tab card holder which clings to data processing machines, file cabinets or any steel surface, has been developed by Beemak Plastics. Each holder has four heavy permanent magnets attached to the back to keep it in place. The container itself is of durable plastic, colored in ivory, red, blue, green, yellow and black to offer color coding and instant recognition. Circle No. 9-8

## Folder Fastener



The new C. L. Barley "Thinline" file folder fastener is factory-imbedded into the folder so that fastener and folder form a single, smooth, non-snag outer surface. The fasteners can be anchored at the factory in any one of four positions on either the first or second leaf of any folder as specified at the time of purchase. The units eliminate snagging of adjacent folders in the file. Circle No. 9-16

## Programmatic Add-Print Punch



A new programmatic add-print punch, which offers a choice of four inputs for eliminating repetitive manual operations in data processing, has been introduced by the Clary Corp.

The optional inputs include a full-keyboard adding machine, a form printer for applications requiring individual hard-copy documents such as receipts, and a 10-key adding machine.

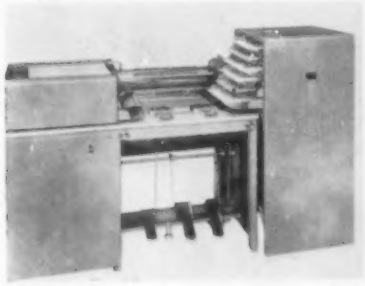
Any five to eight channel code can be punched, and the plug-in diode board permits one punch to prepare tape for different codes and computing equipment.

Automatic punching of functional codes and of fixed digits or alpha characters can be programmed on the units. Circle No. 9-6

### Photocopy-Plate Maker

The Mark IV photocopy and offset plate-making machine is said to make single or multiple photocopy prints by transfer process and diazo prints from translucent material as well as copy book pages without additional equipment or accessories. Handled by International Photocopy Corp., the unit is claimed to be the equivalent of four machines in one. Circle No. 9-14

### Tipping Machine

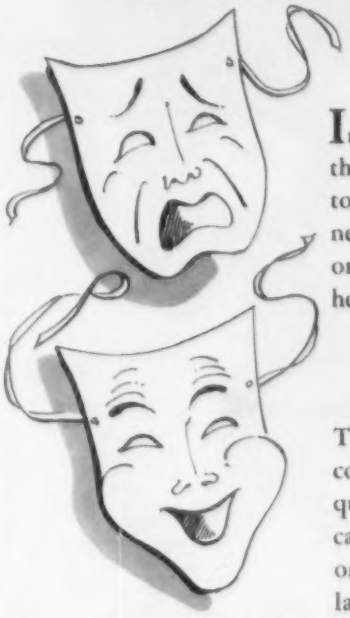


The J. C. Mendes Corp. has increased the paper-handling speeds of its tipping and collating machines from 3,600 to 4,000 cycles per minute. Shown here is the "Paddy" machine which is one of three units for various sizes of offices. Circle No. 9-9

### Paper Cutter

Fast, semi-automatic cutting of printed sheets on which jobs are printed "several up" is the goal of the new Power Paper Cutter by Challenge Machinery Co. The new unit was specifically designed for use in connection with check imprinting systems for banks where the checks are imprinted in sheets and then cut apart for individual depositors. It can also be used for forms and labels in the same manner. Circle No. 9-11


# What does your data processing actually cost?



In most organizations (small or large), the cost is in general overhead. It pays to find out *true* cost. Today's average net profit is so low it may take $40.00 or more in sales to pay for each overhead dollar.

There is a reliable way to establish a cost criterion for data processing requirements in your company—punched card tabulation, special machine work, or programming and utilization of a large electronic computer . . . call us. We cordially invite comparison of R & S costs and results with your *true* internal costs and performances—it may prove interesting.

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R & S services are flexible, we can create systems and procedures to suit the needs of a company, large or small. And, the figures we quote for an assignment are guaranteed—the results assured.

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Montreal: 407 McGill St., Montreal, Canada. Victor 2-3831
Toronto: 439 Wellington St., W., Toronto, Canada. EMpire 3-4951

For More Information Circle Reader Service Card No. 9-64

# *Burroughs Shows Statement Selector*

## An MBA Product Preview

AN automatic statement selector, which, upon command from the bookkeeping machine, electronically searches out any desired statement from a stack of statement forms placed in the feeding tray and inserts it into the carriage of the machine without human assistance, is now being demonstrated by the Burroughs Corp.

Fresh from Burroughs research laboratories, the machine is now being demonstrated at various conventions to check banker reaction. The new unit is considered the answer to the elimination of one of banking's problems—the manual handling of thousands of checking account ledger forms while posting checks and deposits.

Its added assistance comes when the operator has completed posting—for the device then returns the form to a stacker in the proper sequence. Consequently, the new machine could mean that an operator would never touch a ledger form while posting. Her work would be reduced to reading and posting information from the checks to be posted and indexing this into the machine.

This newest development is a part of Burroughs MICR (Magnetic Ink Character Recognition) automation program for banks. In operation, the selector should eliminate 10 posting functions now performed manually. It should still retain both active and inactive statements in correct amount sequence.

Three magnetic ink stripes, now printed on the reverse side of the statement form and acting as both "memory" and trigger mechanism for the present electronic bookkeeping machine could serve double duty by also acting as the trigger and "memory" for the selector device.

Both the selector and the bookkeeping machine could read information and instructions coded into the magnetic tape, according to Burroughs, to carry out their automatic functions. This information would be "written" into the stripes as a normal by-product of posting operations on the bookkeeping machine.

Another possibility offered by the machine is that it could be used to obtain trial balances and transfer balances without human aid. Circle No. 19.

# NEWS

## Computer Participates in Oregon Centennial

Pacific Power & Light Co. is sponsoring an exhibit featuring a Burroughs 205 computer at the 100-day Oregon Centennial in Portland. The computer, at the request of the audience, types out a specially prepared souvenir form which contains a concise summary of major events in Oregon history for any year in the past 100 years.

## Business Show to Host Foreign Executives

Top business management executives from Europe, Asia, and Africa will visit the 1959 National Business Show as part of a special tour set up by Pan American World Airways and Touramerica.

Called the "Study Tour Program for Business Management and Administration Personnel," the tour is run in conjunction with the show and will go from October 17 to 31.

Participants will also see a number of business management operations in firms in New York, Philadelphia, Washington, D. C., and Chicago.

While in New York the foreign executives will be guests of the Office Executives Association, owners of the Business Show. In Philadelphia the National Office Management Association headquarters will act as host, in Washington the Washington Board of Trade will have the honor, while in Chicago the travelers will be in the hands of the Office Management Association of Chicago.

## Expect 2,000 Bankers At NABAC Meeting

More than 2,000 bankers are expected to register for the 35th annual national convention of NABAC, the Association for Bank Audit Control and Operation, when it opens at the Statler Hotel in Boston on September 20-24.

Thirty-five major producers of bank and business equipment have reserved 102 exhibit booths to display their products for the convened bankers.

Malcolm H. Gibson, vice president and cashier, Citizens Bank of Sheboygan, Wis., is NABAC president. He will issue the formal welcome to the assembly.

The opening address is to be delivered by Erwin D. Canham, editor of the Christian Science Monitor and president of the United States Chamber of Commerce.

An afternoon symposium on the mechanization of check handling will be an important high light on the first day.

## Armed Forces, Industry Study Paperwork Problem

The Armed Forces and industry got together in Waukegan, Ill., for a Midwest Office Systems Workshop and Exhibit recently to tackle the problems of paperwork. Pictured here at one of the exhibits are, left to right, A. N. Spence, director, Publications Division, Navy Administrative Office, Washington, D.C.; Rear Adm. E. P. Forrestel, U.S.N., Commandant, Ninth Naval District, Great Lakes, Ill.; and Capt. (Rear Adm. Select) N. J. Goldberg, U.S.N. Commanding Officer, Electronics Supply Office, Great Lakes, who was one of the speakers during the two day meeting.

# FCC Decision Opens Door To Microwave For General Business Use

In a long-awaited decision, the Federal Communication Commission has ruled that there are now available adequate microwave frequencies to take care of present and reasonable foreseeable future needs of both the common carriers and private users for point-to-point communications systems. The Commission said that there is a demonstrated need for private point-to-point communication systems and accordingly, "the decision looks toward liberalization of the basis for issuance of such authorization."

The immediate impact of the FCC ruling will be to speed the use of microwave communications and data transmission by companies having multi-plant inter-city operations.

The ruling stated that there is no basis for generally concluding that the licensing of private communication systems would adversely affect, to any substantial degree, the ability of common carriers to provide service to the general public or adversely affect the users of such common carrier service. Thus, the Commission rejected the stand of the carriers (Bell System, Western Union, etc.) who had contended that a spread of private microwave would force a readjustment of existing rate structures, since the present heavy traffic routes, which serve the industrial communication networks, bear a large part of the burden for maintaining unprofitable low-traffic lines. The carriers had also contended that allocation of microwave frequencies for private use would divert broadcasting space to private operators, and that there was no guarantee that the "valuable and limited" public resource would then best serve the general public.

### Testimony piles up

The FCC hearing (labelled Docket 11866) opened in 1957 and closed last November. The proceedings occupied 30 days of oral hearing and resulted in a 5,000-page hearing transcript besides piling up a mass of testimony and exhibits from virtually every radio-using category in the nation. The last detailed review of the microwave spectrum had been made more than 14 years ago, the Commission noted.

One of the first reactions to the FCC's decision on microwave policy will probably involve a proposed system for Central Freight Lines, Inc. The trucking company has been seeking approval of a microwave hookup between Dallas and Fort Worth in order to speed data handling including facsimile transmission of bills of lading.

Central claims that the common carrier—Southwestern Bell—cannot provide the service at a reasonable cost. Southwestern Bell Telephone Co. and Western Union Telegraph Co. have opposed the application on the grounds that common carrier communications facilities are available and that Central's proposed microwave system would be wasteful duplication of facilities.

### Ask dismissal

The attorney for the trucking line will ask the FCC to dismiss the hearing and grant the application. Among other companies who will probably press for immediate authority to move into microwave networks are Minute Maid Corp. (whose previous request was denied under old FCC policy) and the Chrysler Corp.

*(MBA editors acknowledge the assistance of Robert E. Tall, Editor of the weekly news service, Industrial Communications, in preparing the above news dispatch.)*

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## Leslie Matthies Takes Post at Ross-Martin

Ross-Martin Co., supplier of administrative services and products, Tulsa, Okla., has announced the appointment of Leslie Matthies as

Leslie Matthies

Director of Administrative Research, a newly created post in the company.

Mr. Matthies, the 1958 "Systems Man of the Year," formerly was chief of Engineering Systems and Procedures for Hallamore Electronics in Anaheim, Calif. He has authored more than 100 articles on management subjects and has served as a seminar leader for the American Management Association. He is on the Systems and Procedures Association convention program this fall in Toronto, Canada.

## IBM to Establish Nationwide Datacenters

International Business Machines Corp., in a radical departure from its traditional monthly leasing policy for data processing equipment, has announced that it is establishing 25 to 30 datacenters in major U. S. cities.

The first such center will be in the Wall Street district of New York City. It is expected to open sometime in March of 1960. A Chicago center is scheduled to open in April, and a Los Angeles facility will be ready in May.

The centers will house the IBM 7070 system and will be open to all businesses. A minimum of 15 hours of computing time a month can be taken. The rate for the 7070 system is said to be under $300 an hour.

## Cancel International Automation Exposition

Management of the Fifth International Automation Exposition and Congress has announced the postponement of the show scheduled for the New York Trade Show Building on November 16-20.

Reasons for the postponement were not detailed, but it was hinted that current anti-automation attitudes on the part of labor and some management played an important role in the decision. The show has been rescheduled for 1961.

## E. F. Hutton & Co. First To Use RCA Data Center

The E. F. Hutton & Co. nationwide brokerage firm signed the first contract with Radio Corporation of America to utilize its Electronic Data Processing Center in the Wall Street district of New York City.

The new RCA 501 computer at the center will serve the firm as an "electronic back office," according to Ronello B. Lewis, general partner in charge of office operations.


## MBA REPRINTS

**The following reprint is available at 15¢ each:**

1—**Three-Way Tape Exchange Cuts Paperwork.** The news story describing the new automated method used by the Illinois Central, Southern, and Union Pacific railroads to effect interline settlements.

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**The following are available at 25¢ each:**

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3—**A Complete Automation System Delivers the Goods.** How a complete automation system enabled the Yale Transport Co. to reduce the time of delivery from two to three day service (and longer) provided by most carriers—to an overnight service.

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**The following are available at 50¢ each:**

4—**Westinghouse Automates Engineering Drawings.** A complete description of Westinghouse's use of microfilm in punched aperture cards for the filing and reproducing of engineering drawings.

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6—**Magnetic Tape Pays A.T.&T. Dividends.** One of the largest conversions to business automation ever undertaken by private enterprise—the records of American Telephone and Telegraph Co.'s 1,600,000 shareholders—described in depth.

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# *MBA Reviews*

## Dynamic Management Decision Games

By J. R. Green and Roger L. Sisson. Published by John Wiley & Sons, N. Y. ($2.95)

The business man who says "let's play a game" can no longer be accused of a slight eccentricity or a longing for some old fashioned entertainment. For today, the game may supply the opportunity to anticipate and eventually meet hard-boiled problems of the workaday world.

This new book is designed to help management meet a multitude of problems at all levels and is a change in pace.

Most of the business games constructed until now have been confined primarily to the top management level and more often than not, require an electronic computer.

In this book, the authors present games designed to meet a multitude of problems at all levels. It includes seven non-computer games designed for use in executive-development programs and business administration classes.

Techniques of decision-making are actively demonstrated by suggestions for playing through controlled hypothetical situations that mirror real business developments.

The problems come from such areas as production and inventory control, sales management, retailing and personnel. The games are accompanied by player instructions, instructor background information and referee materials.

Mr. Greene is manager of marketing research in the computer department of General Electric, and Mr. Sisson is connected with Aeronutronic Systems, Inc., and vice president of Canning, Sisson and Associates, Inc.

## Systems and Procedures: A Handbook for Business and Industry

Edited by Victor Lazzaro. Published by Prentice-Hall, price $10.

Victor Lazzaro, of Merrill Lynch, Pierce, Fenner and Smith, is former editor of Systems and Procedures Quarterly. In this book, he has edited the work of 19 associates in the systems and procedures field. He has compiled a 464-page handbook covering every area of systems work including management research and electronic equipment.

Among the contributing authors are Clifford J. Craft, AMA; John W. Haslett, Shell Oil Co.; William P. Leonard, Bendix Aviation Corp.; and William R. Mullee of New York University.

The subjects include: The Systems Study, Systems Charting, The Management Audit, Work Simplification, Forms Design and Control, Tabulating Equipment in Business, Electronic Equipment in Business, Work Sampling in the Office and Selecting and Training Systems Men.

Each of the authors, modestly labeled "experts" on the flyleaf, does an acceptable treatment of the subject assigned. The book should provide an informative guide to those interested in system work.

# *On Request*

*The following booklets, catalogs and brochures are considered of interest to readers of MANAGEMENT and BUSINESS AUTOMATION. Copies can be obtained by using the convenient Reader Service Card and circling the corresponding key numbers.*

RECORD FILES INC.—R. E. Cuthbertson, executive vice president of the company has written a brochure entitled "Poor Herb!" or "How to Prepare a Record Retention Schedule and Plan Your Record Storage Room." Circle No. 9-21

PHOTOSTAT CORP.—"Finer Offset Reproduction" for businesses and offices is a new 12-page booklet prepared by the company to describe the newest line of equipment and methods. Circle No. 9-22

THE SOUNDSCRIBER CORP.—A new brochure describing the firm's 24-hour continuous tape recorder-reproducer is now available. Circle No. 9-23

# MBA's Calendar

**September 14-16** — Electronic Data Processing Workshop sponsored by the American Management Association in Chicago. For details write A.M.A., 1515 Broadway, New York 36, N.Y.

**September 21-24**—14th annual Instrument-Automation Conference and Exhibit of the Instrument Society of America, Palmer House in Chicago.

**September 21-23** — 35th annual National Association of Bank Auditors and Comptrollers convention, Boston, Mass. Statler-Hilton Hotel. Headquarters, 38 S. Dearborn, Chicago 3, Ill.

**September 22-25** — First national exhibition by Office Equipment Manufacturers Institute. National Guard Armory, Washington, D.C. Contact Rudolph Lang, 777 14th St., N.W., Washington 5, D.C.

**October 4-8**—National Business Forms Associates 14th Annual Convention at Chalfonte Haddon Hall Hotel, Atlantic City, N.J. Information from F. J. Ring, secretary, 207 E. Broward Blvd., Ft. Lauderdale, Fla.

**October 12-14**—International Systems Meeting of the Systems and Procedures Association of America, Royal York Hotel, Toronto, Canada.

**October 18-23** — National Business Show, New York Coliseum, New York City.

**October 28-29**—Sixth annual Computer Applications Symposium sponsored by Armour Research Foundation of Illinois Institute of Technology at the Morrison Hotel, Chicago. Contact M. J. Jans, conference secretary, Armour Research Foundation, 10 W. 35th St., Chicago 16, Ill.

**October 28-30**—Second annual Equipment Systems Conference and Exhibit, Conference Building, Balboa Park, San Diego, Calif. This conference is sponsored by the Navy, the City, local colleges and most of the professional groups such as NMAA and SPA.

**November 5-6**—The 23rd annual Industrial Engineering and Management Clinic, Conrad Hilton Hotel, Chicago. Sponsored by Industrial Management Society, 330 S. Wells, Chicago 6, Ill.

**November 11-13**—Sixteenth national meeting of the Operations Research Society of America, Huntington Sheraton Hotel, Pasadena, Calif. Details from ORSA, Mt. Royal and Guilford Aves., Baltimore 2, Md.

**December 1-2**—1959 Eastern Joint Computer Conference, sponsored by the AIEE, ACM, and IRE. Statler Hilton Hotel, Boston, Mass. F. E. Heart, Lincoln Laboratory, Lexington, Mass., is chairman.

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# EDITORIAL

## A New Era In Business Communications

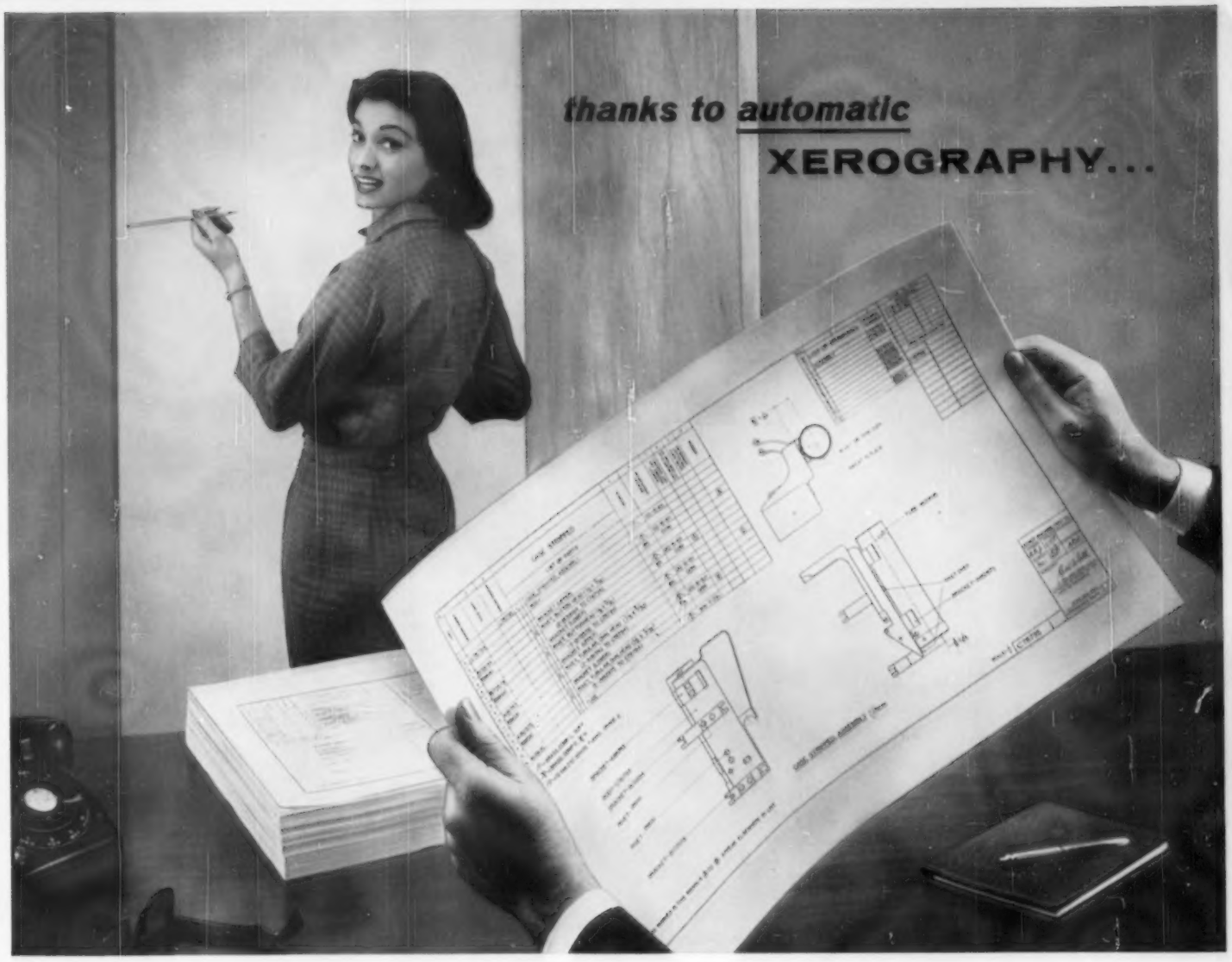
The decision of the Federal Communications Commission to open microwave channels for general business use marks the beginning of a new era in business communications. Industry now has under its control the means for faster, more economical and efficient transmission of business data.

The Commission's ruling is a sweeping victory for industry representatives who claimed private ownership of microwave relay networks was necessary to insure reliability and permit freedom for experimental developments.

While not every business enterprise has need for, nor can afford, private microwave facilities, the trend toward centralized data processing has created a growing desire for such service. Operating under temporary permits, a number of companies have already proven the feasibility of microwave for reliable and economical data transmission. (see MANAGEMENT AND BUSINESS AUTOMATION, August '59.) One company, the Transcontinental Gas Pipe Line Corp., is reported as saying that "if we paid common carrier rates for the service we provide ourselves, it would break us, and the service wouldn't be as good."

The two giants among the nation's common carriers, A. T. & T., and Western Union, are obviously in agreement with the economics of microwave transmission, for they both maintain millions of miles of such service and are constantly increasing their coverage. Just as obvious, and to us quite logical, were their reasons for arguing before the FCC against privately owned microwave operations. They were concerned about the loss of potential revenue.

We believe the Commission has made a wise decision, just as we believe any market loss to the communication companies will be temporary at worst. Microwave will bring about a tremendous expansion of data processing activity with the result that everyone connected with this newest infant of the business automation world should benefit and prosper.

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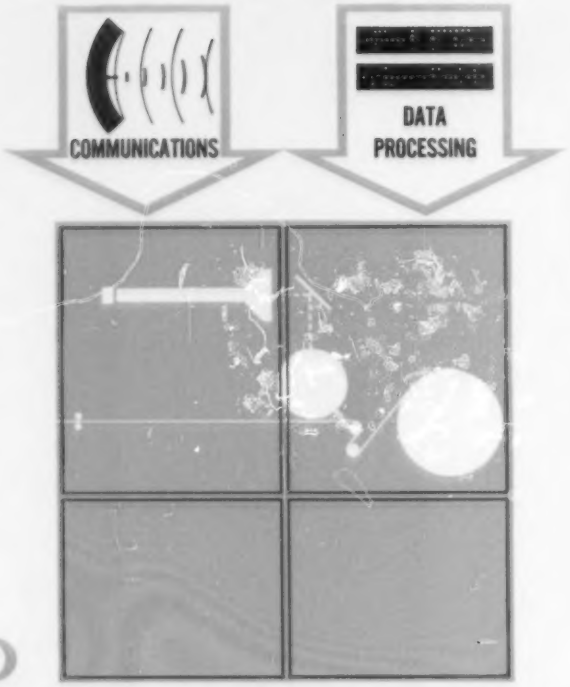


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